ILLUSTRATED GENERIC KEY TO SOUTH AFRICAN CONTINENTAL OSTRACODA

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(With 24 figures)

[*MS. accepted 7 June 1977*]

ABSTRACT

An illustrated generic key to South African continental ostracodes is provided together with the diagnoses of two new cypridopsinid genera, *Sarscypridopsis* and *Kapcypridopsis*.

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INTRODUCTION

In a previous paper (McKenzie 1971*a*) the known continental and mainly freshwater Ostracoda of South Africa were listed together with a complete bibliography of such ostracode studies in the Republic.

This paper complements that previous one by providing an illustrated key to the known ostracode genera of South Africa. The key is meant to be used with reference to illustrations in earlier papers by Sars (1896, 1924*a*, 1924*b*) and Rome (1965) as well as to the illustrations in this text.

Ostracoda are microscopic crustaceans with a bivalve shell which usually completely covers the body when it is closed. This shell is commonly called the carapace. The ostracode body has 5–7 pairs of limbs—7 pairs in freshwater taxa—and, usually, a furca at the posterior, the rami of which attach to paired chitin supports. From the anterior, the limbs are termed as follows: antennule; antenna; mandible; maxillule; and the first through to the third thoracic limbs (P I to P III). The furca normally carries two claws and two bristles on each ramus but can be strongly modified, e.g. into a whip-like seta in Cypridopsinae. Sometimes, as in *Darwinula,* it is absent.

The furca in the genus *Gesa* is described in the key as having two claws only. This follows the original description (Hartmann 1957). However, this

Ann. S. Afr. Mus. **74** (3), 1977: 45–103, 24 figs.

original description was of a juvenile form not of an adult. It is probable that the furca in an adult *Gesa* will be found to carry the normal complement of claws and bristles on each ramus.

Some characters which are illustrated in the Figures are not normally recorded for ostracodes. These include the α, β and γ bristles on the mandible palp which have been so named by Danielopol (personal communication 1970) and which appear to have some utility in taxonomy (e.g. compare Figures 6 and 14). Similarly, rake-like organs are very rarely illustrated but may also prove to be useful taxonomic characters when known for more genera (McKenzie 1971*b*).

There is also a special terminology for characters of the ostracode carapace. These include: adductor muscle scar patterns (Fig. 1 et seq.); marginal or radial pore canals; normal pore canals which can be either simple and open or sieve-like (Fig. 1); and various types of hingement. The hingement terminology used here is that used in the American Treatise on Ostracoda (Moore *ed.* 1961) and is illustrated in Figure 1.

Marginal pore canals are used to distinguish between genera in the tribe Stenocypridini. In particular, the genus *Chrissia* Hartmann, 1957 is distinguished by its very short marginal pore canals, whereas the species which were ascribed to *Parastenocypris* (McKenzie 1971*a*) have well-developed branching marginal pore canals (Figs 15–17).

In this paper the new taxa comprise two new cypridopsinid genera which were foreshadowed earlier (McKenzie 1971*a*), namely: the genus *Sarscypridopsis*; and a new genus from Table Mountain, *Kapcypridopsis*. These new genera are described in the systematics section below.

SYSTEMATICS

Family **Cyprididae**

Subfamily Cypridopsinae

Tribe Cypridopsini

Genus ***Kapcypridopsis*** gen. nov.

Figs 6–7

Type species

Kapcypridopsis barnardi sp. nov.

Derivation of name

Kap = Cape (Afrikaans), *barnardi* for the late Dr K. H. Barnard, a tireless worker on South African crustaceans and molluscs and former director of the South African Museum.

Diagnosis

In lateral view, carapace small; subreniform; smooth; greenish or yellowish; valves subequal; dorsal margin convex; ventral margin inflexed medially;

anterior margin slightly more broadly rounded than the posterior; valve height slightly more than half valve length. In dorsal view, elliptical. Internally, inner lamellae broad anteriorly and posteriorly; inner margin regularly curved; vestibule large; line of concrescence following the outer margin; marginal pore canals short, fairly numerous; normal pore canals open and simple; muscle scar pattern including 4 adductor and 2 mandibular scars (sometimes individual adductor scars are divided and the adductor group appears to consist of 5 or 6 scars); hingement of simple ridge and groove type.

Antennule 7-segmented; length ratios of the 5 proximal segments are 20 : 13 : 10 : 10 : 15 (or 15 : 10 : 8 : 8 : 11). Antenna 4-segmented, length ratios of the 3 proximal segments are 7 : 4 : 1; 'natatory' setae 6 in number, short, reaching about the middle of the second endopod segment. Mandible coxa normal; respiratory epipodial plate with 8 Strahlen; palp 4-segmented; α, β and γ bristles as illustrated. Maxillule respiratory epipod with 4 downwards-directed setae plus 17 Strahlen; lobes and palp elongate; palp 2-segmented, 3rd lobe with two smooth Zahnborsten. P I epipod with 4 Strahlen; palp strongly dimorphic as is usual in cypridaceans with 3 terminal bristles in females but modified into a clasping organ in males. P II normal, with a powerful terminal claw. P III with a short terminal segment which bears a fairly short reflexed seta. Furca strongly modified, whip-like. Rake-like organs each with about 10 teeth. Eye with 2 ommatophores. In males, other dimorphic characters include a Zenkers organ with 13 whorls; and hemipenis as illustrated (Fig. 7: 7).

Dimensions

Length, about 0,6 mm; height, about 0,35 mm.

Material

Small population of six individuals including mature males and ovigerous females. Some forms were greenish, others yellowish, when collected.

Syntypes: South African Museum catalogue number SAM–A15451.

Locality

Top of Table Mountain, in small pool about 400 m from the cable car terminus; Cape Town, Cape Province, the Republic of South Africa.

Collector and data collected

K. G. McKenzie; September 1970.

Discussion

The regularly subreniform shape of this taxon is sufficient to distinguish it from *Plesiocypridopsis* Rome, *Cypridopsis* Brady, and *Sarscypridopsis* gen. nov. since *Plesiocypridopsis* and *Sarscypridopsis* are subtriangular in shape while *Cypridopsis* is subovate and this new genus is subreniform. Also, unlike these genera, *Kapcypridopsis* has broad anterior *and* posterior inner lamellae.

Genus: ***Sarscypridopsis*** gen. nov.

Fig. 8

Type species

Sarscypridopsis gregaria (Sars) 1896.

Derivation of name

For G. O. Sars, pioneer worker on South African Ostracoda.

Diagnosis

In lateral view, carapace small-medium; subtriangular; surface pitted and frequently hirsute; often greenish to brown; valves subequal; dorsal margin strongly convex; ventral margin inflexed medially; anterior margin rounded, tending to narrow anteroventrally; posterior margin more broadly rounded than the anterior margin; valve height usually well over half valve length. In dorsal view elongate subovate moderately broad (breadth about half the length); greatest breadth behind the middle. Internally, inner lamellae moderately broad anteriorly and narrow posteriorly; inner margin regularly curved, vestibule large, line of concrescence following the outer margin; marginal pore canals short, numerous; normal pore canals simple, open; central muscle scar pattern of 4 adductors and 2 mandibulars; hingement of simple ridge and groove type.

Antennule 7-segmented; antenna 4-segmented; natatory setae extending well beyond the tips of the terminal claws; mandible normal, α, β and γ bristles as illustrated (Fig. 8: 2); maxillule palp 2-segmented, elongate-cylindrical; 3rd lobe with 2 smooth Zahnborsten; P I epipod with 2 Strahlen; endopod modified in males into a clasping organ which is dissimilar between the right and left limbs (Fig. 8: 10, 13); P II normal with powerful terminal claw; P III with a short reflexed seta; furca whip-like. In males, other dimorphic characters include a Zenkers Organ with 10–15 whorls; and hemipenis as illustrated.

Discussion

Of the three species in the original designation of *Cypridopsis* by Brady and Norman in 1889, one, *Cypridopsis vidua* (O. F. Müller, 1776), is the type species; *C. villosa* (Jurine, 1806) was made the type species of *Cypridopsella* Kaufmann, 1900, which is now synonymised with *Potamocypris* Brady, 1868, and *C. aculeata* Costa, 1847, was included by Sars (1924*a*: 160) with the South African species of *Cypridopsis* in his understanding of the genus at that time and indeed was made its type. However, *C. vidua* has priority as the type species of *Cypridopsis* s.s. which means that a different generic name is required for the African and possibly one European species (note that the type material of Costa's species has been lost and his original figures and descriptions were poor).

The tribe Cypridopsini is differentiated from other cypridopsine ostracodes by the fact that it possesses an elongate maxillule palp and lobes, the palp being further characterized by an elongate second segment. This feature is in contradistinction to the broad palp, especially at the second segment, of *Potamocypris* and its related cypridopsine genera. Considered in this sense, Cypridopsini include the genera *Cypridopsis*, *Plesiocypridopsis*, *Neocypridopsis*, *Kapcypridopsis*, the present new genus *Sarscypridopsis*, and two Korean subspecies (McKenzie 1972) which appear to be generically distinct from these others although similar in some features to *Kapcypridopsis*.

This genus differs from *Cypridopsis* in that the shape is subtriangular and moderately broad rather than subovate and broad; the anterior inner lamellae are narrower, the ventral margin of the right valve is not denticulate; and there are only up to two Strahlen on the epipod of the P I. It differs from *Plesiocypridopsis* in lacking the elongation of male P I palps and the characteristic upturned anterior hemipenes of that genus. *Kapcypridopsis* is subreniform in shape with broader anterior and posterior inner lamellae and short antennal 'natatory' setae, differing in all these characters from *Sarscypridopsis*. The Korean taxa differ somewhat in shape especially posteriorly and have broad anterior and posterior inner lamellae and short antennal 'natatory' setae. The genus *Neocypridopsis* differs from *Sarscypridopsis* in general shape and also in the setation of the terminal segment of the P III, the shapes of the clasping palps of the male P I and in possessing an upturned not a downturned anterior hemipenis.

Of the cypridopsinid species listed by Sars (1924*a*) *aculeata* Costa, 1847, *spinifera* Sars, 1924*a*, and *echinata* Sars, 1924*a*, form a subgroup characterized by an armature of spines as well as hairs on the shell surface. These species are at present classed with *Sarscypridopsis* but may merit transfer to a new category when *aculeata* Costa, 1847, is better understood. Apart from this latter species, which has been recorded from Iceland, Europe, central Asia, the Americas and Africa, *Sarscypridopsis* has a southern distribution.

KEY

1. All three pairs of thoracic legs more or less pediform and non-reflexed .. .. 2.
   First pair of thoracic legs non- or subpediform, strongly dimorphic; second pair pediform; third pair strongly reflexed .. Cyprididae 7.
2. Shell small; smooth; elongate-ovate in lateral view; adductor-muscle scar pattern feather-shaped; first pair of thoracic legs (P I) subpediform; males not reported since 1870
   Darwinulidae, *Darwinula* (Fig. 1)
   Shell small to medium; surface usually ornamented; subrectangular, subreniform, subtrapezoidal or subrhomboidal in lateral view; adductor-muscle scar pattern of four discrete scars in a subvertical row; all three pairs of thoracic limbs pediform; typically bisexual
   Cytheridae 3.

3. Shells small or medium; ornamented; subrectangular to subreniform; radial pore canals few, straight; normal pore canals simple; hinges modified lophodont .. .. Limnocytherinae 4.
Shells small or medium; ornamented; subrectangular, subtrapezoidal or subrhomboidal; radial pore canals few or numerous, usually straight; normal pore canals of sieve type; hinge types merodont, entomodont or gonglyodont .. Cytherideinae, Loxoconchinae 5.

4. Shell small; subrectangular to subreniform; non-dimorphic *Limnocythere*
Shell medium; subrectangular; strongly dimorphic (females very broad, but males slender, posteriorly) .. .. *Gomphocythere* (Fig. 2)

5. Shell small to medium; subrectangular or subtrapezoidal; radial pore canals few or numerous; hinge type merodont or entomodont Cytherideinae 6.
Shell small; subrhomboidal; radial pore canals few, straight; hinge type gonglyodont .. .. *Loxoconcha* (Fig. 1)

6. Shell small-medium; subtrapezoidal; radial pore canals few; hinge type merodont .. .. *Perissocytheridea*
Shell medium; subrectangular; radial pore canals numerous; hinge type entomodont .. .. *Cyprideis* (Fig. 1)

7. Shell medium; subrectangular; surface pitted, dorsomedial sulci present; palps of first pair of thoracic legs two-segmented Ilyocypridinae, *Ilyocypris* (Fig. 3)
Shell differing from this; palps of first pair of thoracic legs non-segmented .. .. 8.

8. Third thoracic limb bearing at least one long reflexed terminal seta; Zenkers Organ (males only) with 5–6 whorls .. Paracypridinae, Candoninae and Cyclocypridinae 9.
Third thoracic limb with short reflexed terminal seta; Zenkers Organ (males only) with more than 6 whorls .. .. 12.

9. Shell medium, subreniform or elongate subtriangular in lateral view; elliptical in dorsal view, antennal natatory setae poorly developed or absent .. .. Paracypridinae, Candoninae 10.
Shell small-medium, subquadrate in lateral view; antennal natatory setae well developed (extending to the terminal claws or beyond) Cyclocypridinae 11.

10. Shell medium, elongate-subtriangular in lateral view; furca with a posterior bristle, furcal claws without spurs Paracypridinae, *Paracypris*
Shell medium, subreniform in lateral view; furca lacking a posterior bristle, furcal claws with spurs .. .. Candoninae, *Candonopsis*

11. Shell small-medium; right valve denticulate ventrally especially on anteroventral margin; compressed in dorsal view; furca normal Cyclocypridinae, *Physocypria* (Figs 3–4)
Shell small; non-denticulate ventrally; broadened in dorsal view, furca normal .. .. Cyclocypridinae, *Cyclocypris*

12. Shells small to very large; furca with at least two terminal claws .. 19.
Shells small to medium; furca whip-like.. .. Cypridopsinae 13.

13. Shell with distinctive pustulose surface ornamentation and characteristic lunette-bearing inner lamellae; maxillule 3rd lobe with at least four Zahnborsten .. .. *Oncocypris* (Fig. 5)
Shells different; maxillule 3rd lobe with two Zahnborsten .. .. 14.

14. Shell subtriangular, produced at each end; left valve overlapping right valve anteriorly and posteriorly, but overlapped by the right valve dorsally; maxillule palp distal segment spatulate *Cyprilla* (Fig. 5)
Shell of a different type; maxillule palp elongate .. .. .. 15.

15. Shell small-medium; subtriangular to subovate in lateral view; ovate in dorsal view; left valve overlapping right valve anteriorly; anterior inner lamellae broad, posterior inner lamellae narrow .. .. 16.
Shells of a different type .. .. 17.

16. Shell typically whitish to greenish, usually with two or three irregular dark strigae on each valve in life; right valve denticulate anteriorly; inner lamellae as illustrated .. .. .. *Cypridopsis* (Fig. 4)
Shell typically whitish; ornamented with pits arranged concentrically or else tuberculate; without strigae; inner lamellae as illustrated *Zonocypris* (Fig. 9)

17. Shell small-medium to medium; subtriangular in lateral view; relatively compressed in dorsal view; right valve overlapping left valve anteriorly; anterior and posterior inner lamellae rather narrow; antennal natatory setae well developed .. .. 18.
Shell small to small-medium; valves subequal; subreniform in lateral view; without strigae on the valves; anterior and posterior inner lamellae both relatively broad; antennal natatory setae short *Kapcypridopsis* (Figs 6–7)

18. In males, palp of first thoracic legs elongate, hemipenis anterior lobe curved upwards .. .. *Plesiocypridopsis* (Fig. 9)
In males, palp of first thoracic legs of normal length, hemipenis anterior lobe pointing downwards .. *Sarscypridopsis* (Fig. 8)

19. Shell small-medium to medium; smooth (Cyprettini, Bradycyprini) or pitted (Cyprettini) or striate (Bradycyprini); subglobose in lateral and dorsal view; radial septa well developed at least in right valve; furca 'normal' but slender (Bradycyprini) or very slender (Cyprettini) Cyprettinae 20.
Shell medium to very large, typically smooth; compressed to globose in dorsal view; without radial septa (exception *Stenocypris*, cf. 29); furca 'normal', not conspicuously slender .. .. 22.

20. Radial septa developed in both valves .. Cyprettini—*Cypretta* (Fig. 10)
Radial septa developed in right valve only .. Bradycyprini 21.

21. Shell striate .. .. *Paracypretta* (Figs 10–12)
Shell smooth .. .. *Bradycypris* (Figs 11–12)

22. Chitin supports with loculi where they branch proximally, furca flexuous .. .. Cypricercini 23.
Chitin supports without loculi where they branch proximally; furca typically straight or evenly curved, rarely flexuous .. .. .. 25.
23. Shell oval, with distinct posterior process in some species; chitin supports with anterior branch well developed; spermatic vesicles (♂ only) coiled anteriorly .. .. *Cypricercus* (Fig. 12)
Shell oval-oblong, without posterior processes; chitin supports without an anterior branch .. .. 24.
24. Furca normally developed (2 claws and 2 bristles) .. *Tanycypris*
Furca with two claws only .. .. .. *Gesa* (cf. Introduction)
25. Shell without a posterior inner lamella (the inner margin coincides posteriorly with the posterior shell margin cf. Rome 1965) .. .. 26.
Shells with a posterior inner lamella .. .. 27.
26. Distal segment of the P II with a short dorsal bristle (Rome 1965) Isocypridini, *Isocypris* (Fig. 13)
Distal segment of the P II with a dorsal bristle which is almost as long as the terminal claw (Rome 1965) Amphibolocypridini, *Amphibolocypris*
27. Chitin supports widened distally into triangular chitinous processes *Herpetocypris*, Stenocypridini 28.
Chitin supports without distal triangular chitinous processes .. 31.
28. Furcal rami similar, furca with a posterior bristle *Herpetocypris* (Figs 13–14)
Furcal rami dissimilar; furca without a posterior bristle Stenocypridini 29.
29. Shells with radial septa .. .. *Stenocypris*
Shells without radial septa .. .. 30.
30. Marginal pore canals very short .. .. *Chrissia* (Fig. 17)
Marginal pore canals well developed and branched *Parastenocypris* (Figs 14–17)
31. Either right or left valve of shell denticulate ventrally except *Homocypris* which, however, is of medium size only (length 1,1–1,4 mm) and has a normal furca .. .. Cyprinotini 32.
Neither right nor left valve of shell denticulate ventrally (except *Apatelecypris* cf. 42); carapace large, at least 1,75 mm, except *Mesocypris* (0,91 mm) which has an unique furca, cf. 34 .. .. 34.
32. Shell elongate-subreniform in lateral view; anterior inner lamellae distinctly broader than posterior inner lamellae *Homocypris* (Figs 17–18)
Shell elongate-ovate in lateral view; both anterior and posterior inner lamellae relatively, and subequally narrow .. .. 33.
33. Right valve denticulate antero- and/or posteroventrally *Heterocypris* (Fig. 18)

Left valve denticulate antero- and/or posteroventrally *Hemicypris*

34. Furca normally developed (2 claws, 2 bristles) and not modified as below .. .. 35.

Furca with the posterior 'bristle' transformed into a stubby claw-like spine; furcal rami weakly dissimilar .. .. .. *Mesocypris*

35. Carapace large, with prominent secondary fused zone in right valve *Afrocypris* (Figs 18–20)

Carapace large, without prominent secondary fused zone in right valve 36.

36. Carapace large; maxillule palp elongate .. .. 37.

Carapace large; maxillule palp relatively broad (i.e. approximately square or spatulate) .. .. 39.

37. Carapace large, without ventral ala; penultimate 'segment' of P II divided .. .. Eucypridini, *Eucypris* (Fig. 19)

Carapace large, with or without ventral ala; penultimate 'segment' of P II not divided .. .. Cypridini 38.

38. Carapace large, with ventral ala .. .. .. *Pseudocypris* (Fig. 20)

Carapace large, without ventral ala .. .. *Cypris*

39. Carapace large, tuberculate in one species; antennal natatory setae well developed, reaching about as far as the distal part of the terminal segment .. .. *Sclerocypris* (Fig. 21)

Carapace large, smooth to distinctly hirsute; antennal natatory setae strongly reduced .. .. 40.

40. Carapace large, in general shape resembling *Homocypris*; P I palps (♂ only) strikingly dissimilar on left and right limbs; hemipenes (♂ only) unlike those of any other ostracode; shape of female genital lobe also distinctive .. .. *Liocypris* (Fig. 22)

Carapace large; general shape unlike that of *Homocypris*; P I palps (♂ only) not strikingly dissimilar on left and right limbs, hemipenes (♂ only) different to *Liocypris* .. .. .. Megalocypridini 41.

41. Carapace large; with a small but distinct posteroventral caudal spine on each valve .. .. *Hypselecypris*

Carapace large; without such a spine on either valve .. .. .. 42.

42. Carapace large; in dorsal view indented at both ends; not denticulate posteroventrally .. .. *Megalocypris* (Figs 23–24)

Carapace large; in dorsal view narrowing anteriorly, but rounded, not indented, posteriorly; denticulate posteroventrally *Apatelecypris* (Fig. 24)

ACKNOWLEDGEMENTS

I am grateful to the National Institute for Water Research, Pretoria and to the British Museum (Natural History) London for the opportunity to work in South Africa and to Dr R. G. Noble who organized my visit. My original drawings were traced for publication by Mr D. Goode of the Transvaal Museum. My thanks are due to Professor P. H. A. Sneath and Dr M. J. Sackin of the

University of Leicester, who prepared the computer key of the appendix, using the PANKEY program.

I am particularly grateful to Dr T. H. Barry, Director of the South African Museum, for the extended use of its laboratory and library facilities during my working visit to Cape Town, also to Dr B. F. Kensley at the South African Museum for his considerable assistance in reorganizing the illustrations.

Mrs L. Vennell, Riverina College of Advanced Education, typed the manuscript.

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APPENDIX

South African Freshwater Ostracoda Generic Key

(prepared by the Program PANKEY).

1.	Shell: surface not smooth	2.
2.	Furca reduced to whip-like seta	3.
3.	Dorsal view of shell broad	4.
4.	Maxillule 3rd lobe with 4 or more Zahnborsten, maxilla epipod with less than 3 Strahlen, shell denticulation in one or both valves absent, shell: radial septa or lunettes in inner lamellae present in both valves, shell surface pustulose not tuberculate-costate.	*Oncocypris*
4.	Maxillule 3rd lobe with 2 Zahnborsten, maxilla epipod with more than 3 up to 6 Strahlen, shell denticulation in one or both valves present, shell: radial septa or lunettes in inner lamellae, shell surface tuberculate-costate not pustulose	*Zonocypris*
3.	Dorsal view of shell 'normal'	5.
5.	Parthenogenesis: males virtually unknown, shell denticulation in one or both valves present.	*Cypridopsis*
5.	Parthenogenesis: both sexes known	6.
6.	Maxilla male epipod not elongated.	*Cyprilla*
6.	Maxilla male epipod elongated	*Plesiocypridopsis*

2. Furca 'normal' 7.
7. 7th limb reflexed, terminal seta long 8.
8. Maxilla endopod 2-segmented, chitin supports: distally with simple point, Zenker's Organ with more than 15 whorls, shell: dorsal sulci present *Ilyocypris*
8. Maxilla endopod unisegmented 9.
9. Shell denticulation in one or both valves present *Physocypria*
9. Shell denticulation in one or both valves absent *Cyclocypris*
7. 7th limb reflexed, terminal seta short 10.
10. Furcal rami very slender, Zenker's Organ with 7–14 whorls, shell: radial septa or lunettes in inner lamellae present in both valves, shell length 0,45–0,90 mm *Cypretta*
10. Zenker's Organ with more than 15 whorls 11.
11. Furcal rami slender, shell: radial septa or lunettes in inner lamellae present in one valve, shell surface striate, shell length 0,90–1,75 mm *Paracypretta*
11. Furcal rami 'normal' 12.
12. Dorsal view of shell broad *Cypris*
12. Dorsal view of shell 'normal' *Sclerocypris*
1. Shell: surface smooth (includes weak pitting) 13.
13. 7th limb penultimate segment undivided 14.
14. Parthenogenesis: both sexes known, maxilla epipod with less than 3 Strahlen *Candonopsis*
14. Parthenogenesis: males virtually unknown 15.
15. Mandible palp comb present, maxilla epipiod with more than 7 Strahlen, maxilla endopod 3-segmented, 7th limb not reflexed, furca absent, shell: inner lamellae absent. *Darwinula*
15. Mandible palp comb absent, maxilla epipod with more than 3 up to 6 Strahlen, maxilla endopod unisegmented (but 'ghost' segmentation indicated), 7th limb reflexed, furca 'normal', shell: inner lamellae present. *Paracypris*
13. 7th limb penultimate segment divided 16.
16. Natatory setae of antennae weakly developed 17.
17. Maxilla epipod with less than 3 Strahlen, furca: posterior margins dissimilar, shell densely hirsute *Mesocypris*
17. Maxilla epipod with more than 3 up to 6 Strahlen 18.
18. Furca reduced to whip-like seta, Zenker's Organ with 7–14 whorls, shell length 0,45–0,90 mm *Kapcypridopsis*
18. Furca 'normal' 19.
19. Chitin supports: distally with simple point *Liocypris*
19. Chitin supports: distally elaborated 20.
20. Shell denticulation in one or both valves absent, shell length 3,60–7,30 mm *Megalocypris*
20. Shell denticulation in one or both valves present, shell length 1,75–3,60 mm *Apatelecypris*
16. Natatory setae of antennae well developed 21.
21. Chitin supports: distally elaborated 22.
22. Furca: posterior bristle absent 23.
23. Shell length 1,75–3,60 mm 24.
24. Shell: radial septa or lunettes in inner lamellae present in both valves *Stenocypris*
24. Shell: radial septa or lunettes in inner lamellae absent '*Parastenocypris*'
23. Shell length 0,90–1,75 mm 25.
25. 6th limb: distal bristle almost as long as the distal claw, furca: posterior margins similar, chitin supports: triangular process absent, dorsal view of shell very compressed, shell: inner lamellae absent posteriorly *Amphibolocypris*

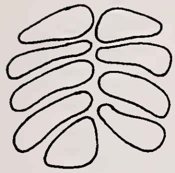
25.	6th limb: distal bristle short, furca: posterior margins dissimilar, chitin supports: triangular process present, dorsal view of shell normal, shell: inner lamellae present	*Chrissia*
22.	Furca: posterior bristle present	26.
26.	Chitin supports: triangular process present, shell length 1,75–3,60 mm	*Herpetocypris*
26.	Chitin supports: triangular process absent	27.
27.	Dorsal view of shell very compressed, shell: inner lamellae absent posteriorly, shell length 0,90–1,75 mm	*Isocypris*
27.	Dorsal view of shell 'normal'	28.
28.	Shell posterior processes absent	*Afrocypris*
28.	Shell posterior processes present	*Hypselecypris*
21.	Chitin supports: distally with simple point	29.
29.	Dorsal view of shell broad	30.
30.	Furcal rami slender, shell: radial septa or lunettes in inner lamellae present in one valve, shell length 0,90–1,75 mm	*Bradycypris*
30.	Furcal rami 'normal'	31.
31.	Dorsal view of shell: alae absent	*Eucypris*
31.	Dorsal view of shell: alae present	*Pseudocypris*
29.	Dorsal view of shell 'normal'	32.
32.	Chitin supports: loculi present where they branch proximally	33.
33.	Chitin supports: loculi present and prominent anterior branch, shell posterior processes present	*Cypricercus*
33.	Chitin supports: loculi present but without prominent anterior branch, shell posterior processes absent	*Tanycypris*
32.	Chitin supports: loculi absent where they branch proximally	34.
34.	Shell denticulation in one or both valves absent, shell inner lamellae: anterior broad posterior narrow	*Homocypris*
34.	Shell denticulation in one or both valves present	35.
35.	Shell denticulation in right valve	*Heterocypris*
35.	Shell denticulation in left valve	*Hemicypris*

REFERENCE

Pankhurst, R. J., 1970. A computer program for generating diagnostic keys. *Computer J.* **12**: 145–151.

Fig. 1

1. *Darwinula* sp.; ovigerous ♀; adductor muscle scars, left valve. × 175.
2. *Darwinula* sp.; ovigerous ♀; outline right valve. × 125.
3. Generalized rimmed normal pore canal. × 1400.
4. Generalized rimless normal pore canal. × 2500.
5. Generalized sieve type normal pore canal. × 1000.
6. Generalized lophodont hingement right valve (after Moore *ed.* 1961).
7. Generalized merodont hingement right valve (after Moore *ed.* 1961).
8. Generalized entomodont hingement right valve (after Moore *ed.* 1961).
9. Generalized gonglyodont hingement right valve (after Moore *ed.* 1961).
10. *Cyprideis* sp.; hingement right valve. × 100.
11. *Cyprideis* sp.; adductor muscle scars and fulcral scar (dashes). × 225.
12. *Loxoconcha* sp.; adductor muscle scars and fulcral scar (dashes). × 300.
13. *Loxoconcha* sp.; anterior hingement right valve. × 250.



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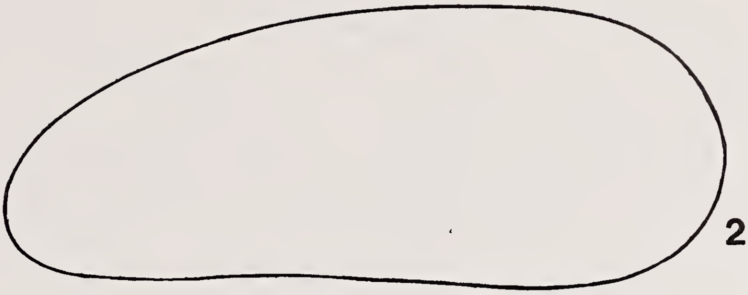

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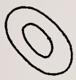

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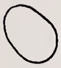

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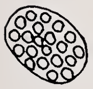

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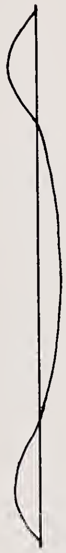

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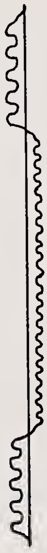

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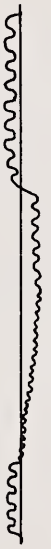

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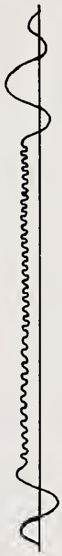

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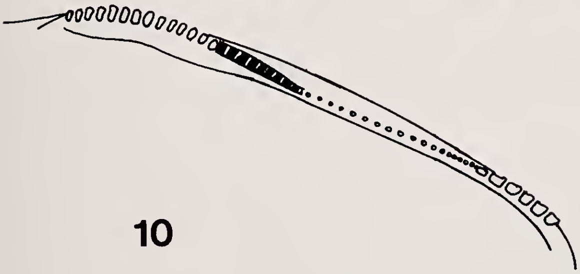

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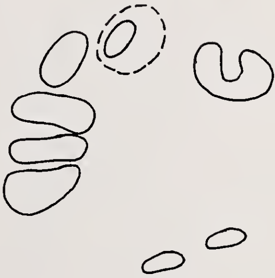

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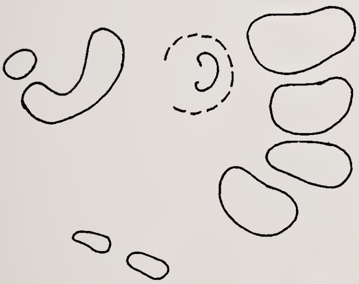

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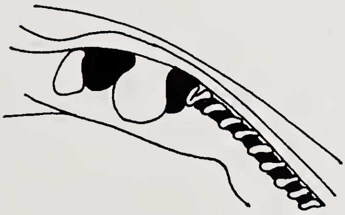

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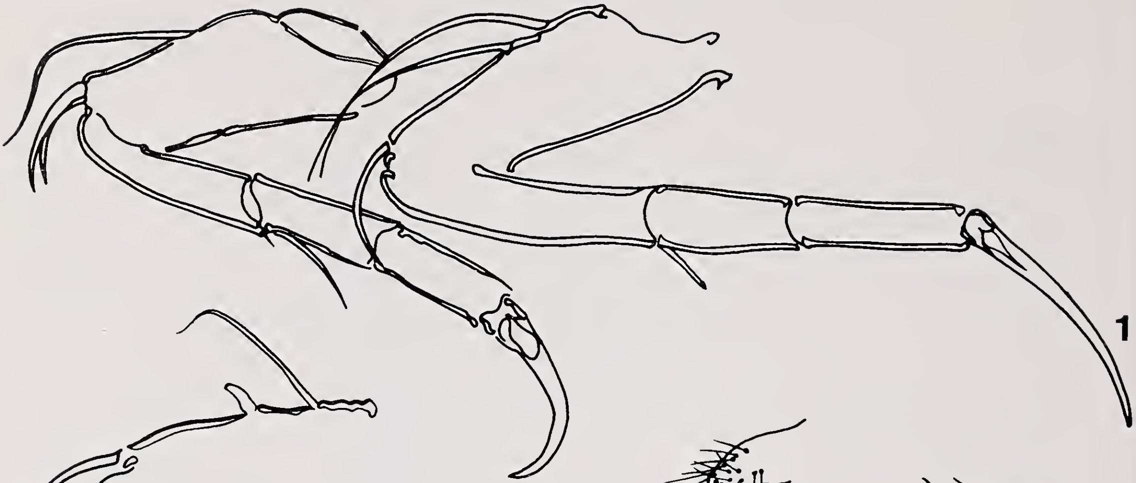
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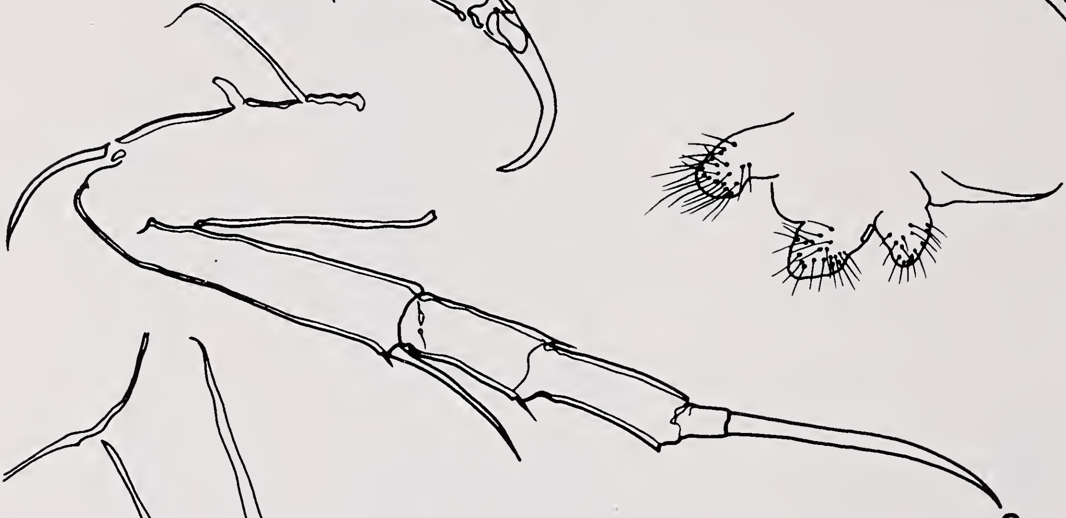
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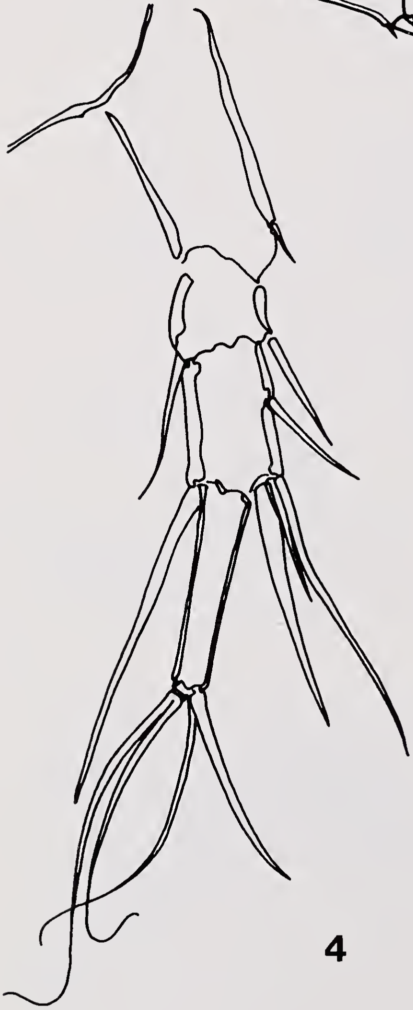
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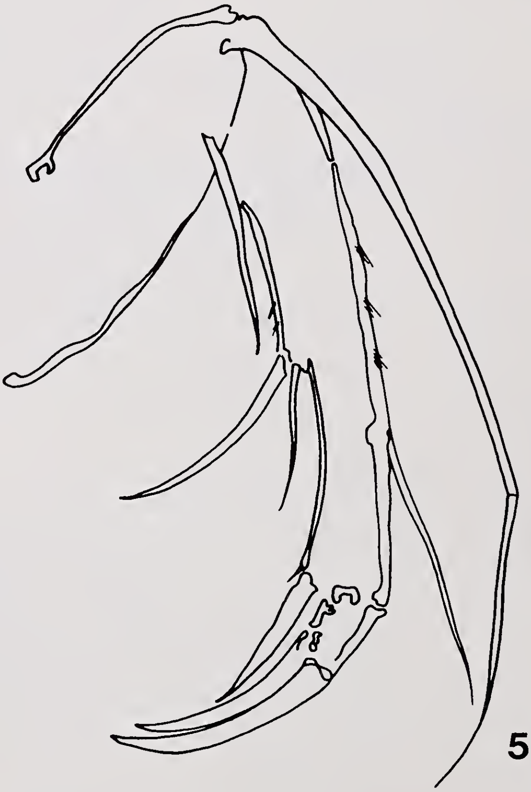
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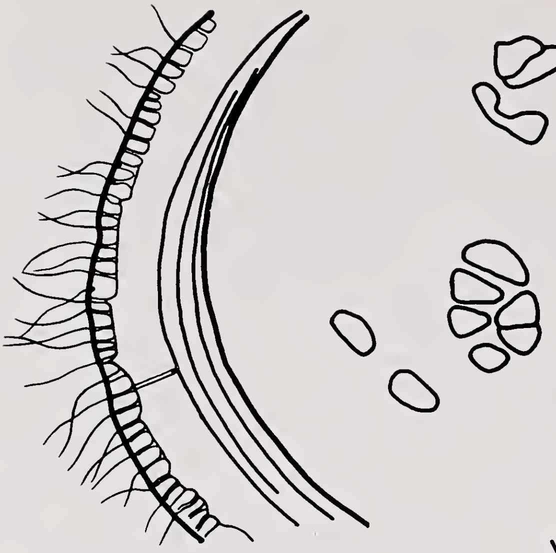
Fig. 2

1. *Gomphocythere expansa* Sars, 1924; SAM–A11303; ovigerous ♀; P I and P II. × 400.
2. Posterior of body with caudal lobes. × 400.
3. P III. × 400.
4. Antennule. × 400.
5. Antenna. × 400.



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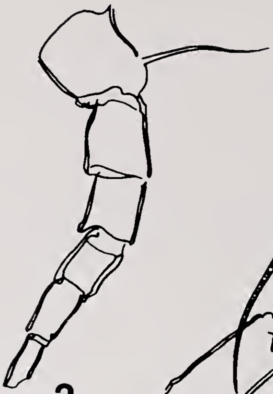

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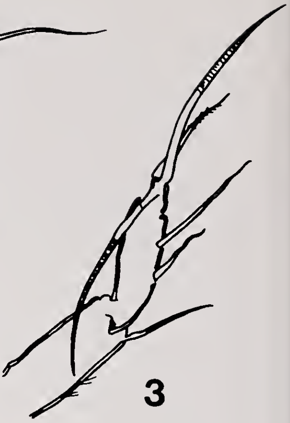

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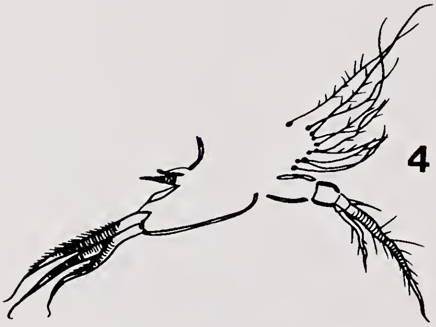

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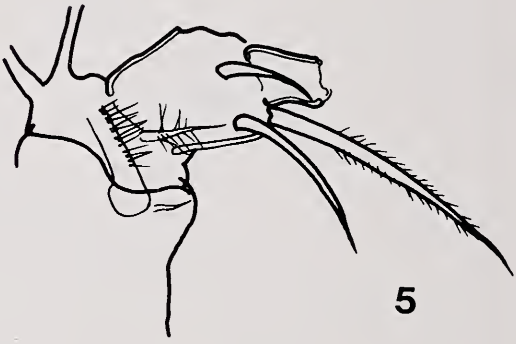

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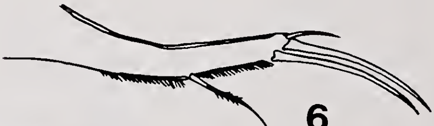

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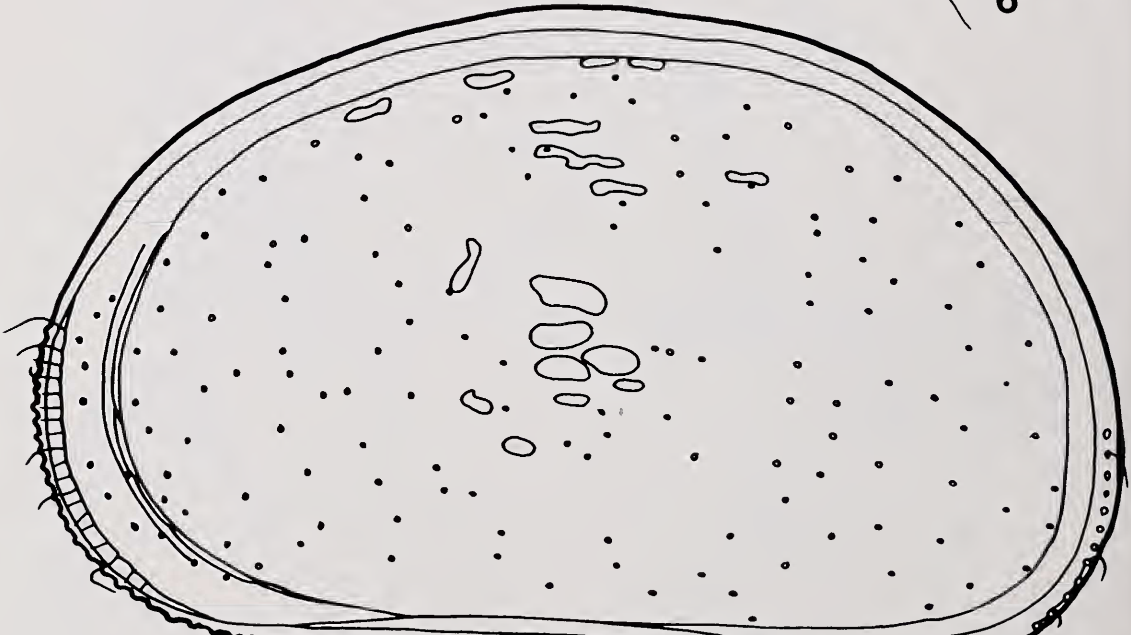

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Fig. 3

1. *Ilyocypris australiensis* Sars, 1889; SAM–A11; adult ♀; detail anterior margin right valve showing radial pore canals and muscle scars. × 160.
2. Antennule, six terminal segments. × 400.
3. P III, terminal segments. × 400.
4. P I. × 400.
5. Mandible palp. × 400.
6. Furca. × 400.
7. *Physocypria capensis* (Sars, 1896); SAM–A11136; adult ♂; internal view right valve. × 160.

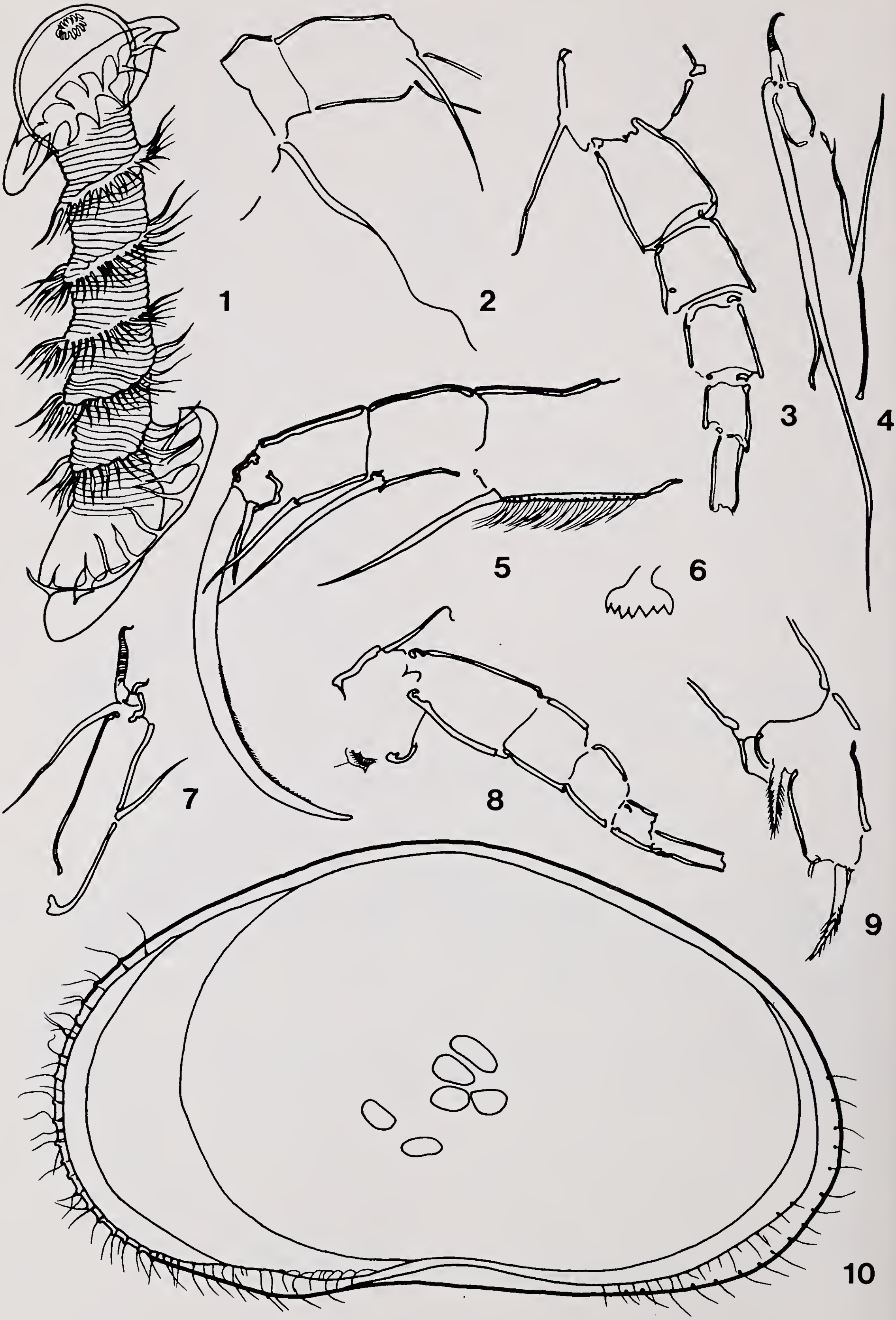
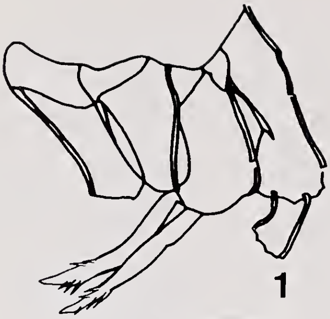


Fig. 4

1. *Physocypria capensis* (Sars, 1896); SAM–A11136; adult ♂; Zenkers Organ. × 400.
2. Mandible palp, detail β and γ bristles. × 400.
3. Antennule, six terminal segments. × 400.
4. P III, terminal segment. × 400.
5. *Cypridopsis viduella* Sars, 1896; SAM–A11171; adult ♀; P I. × 400.
6. Rake-like organ. × 400.
7. P III, terminal segment. × 400.
8. Antennule, six terminal segments. × 400.
9. Mandible palp, detail α, β and γ bristles. × 400.
10. Internal view right valve. × 160.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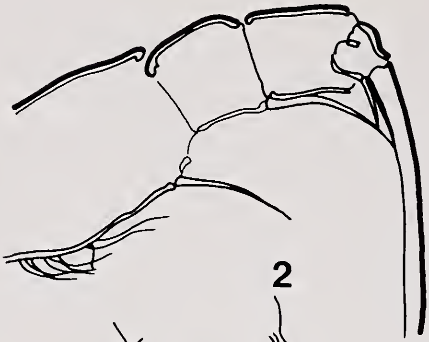
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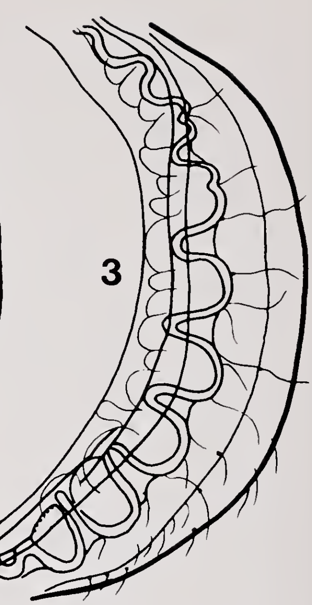
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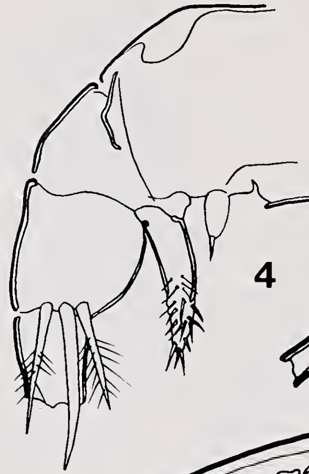
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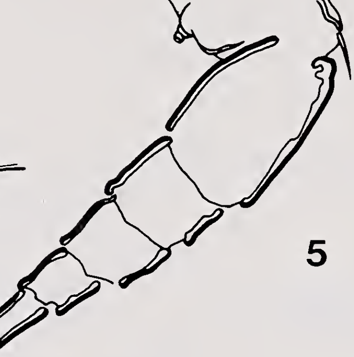
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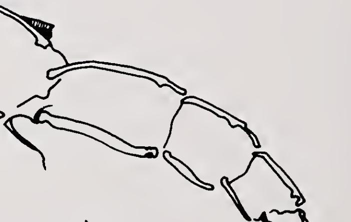
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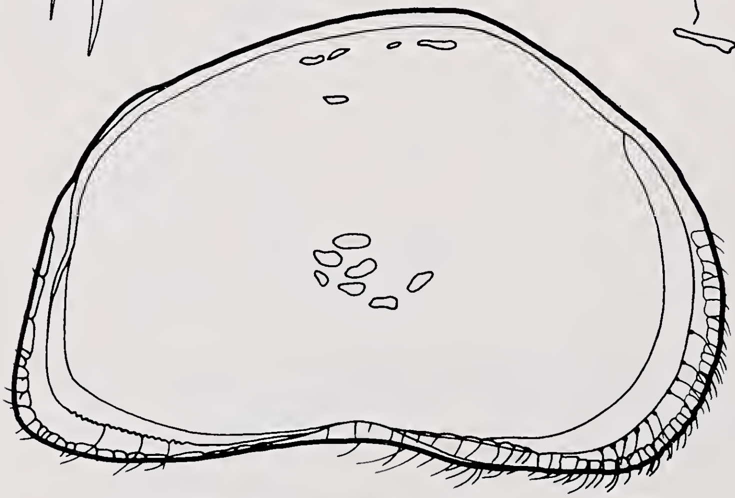
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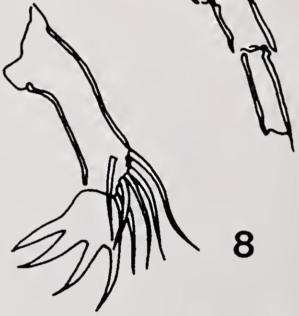
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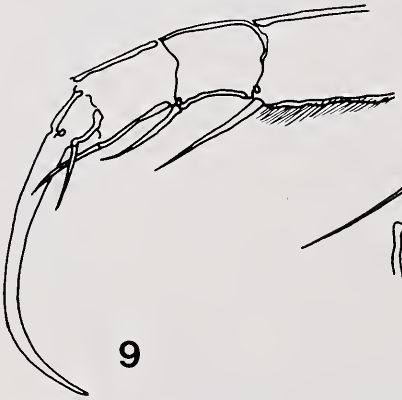
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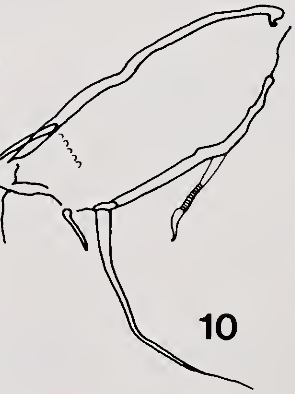
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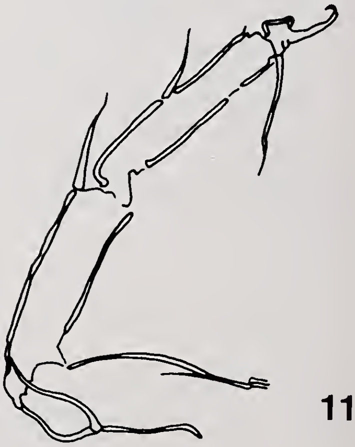
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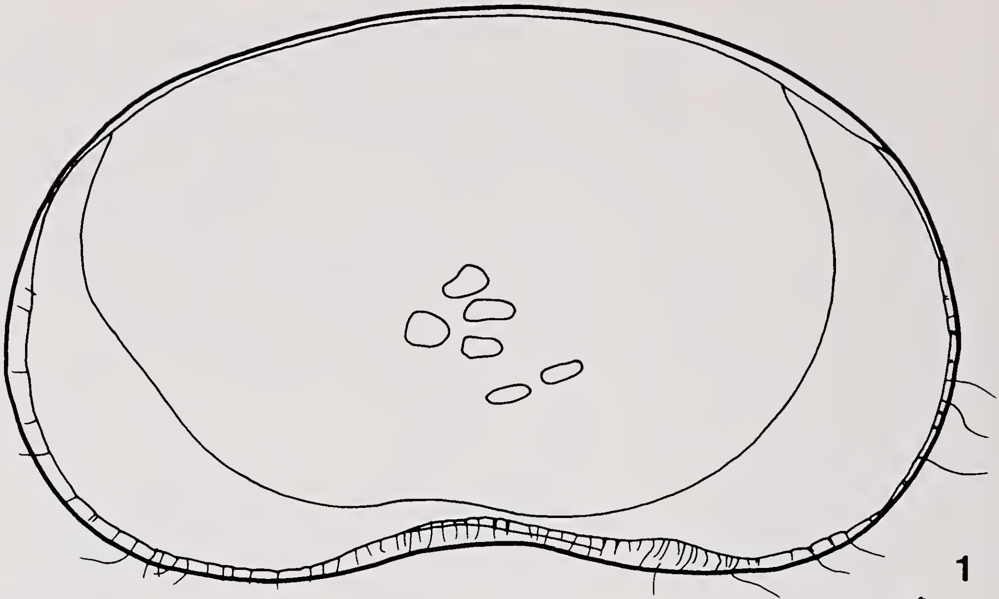
Fig. 5

1. *Oncocypris* cf. *voeltzkowi* Müller, 1898; SAM–A11374; ovigerous ♀; maxillule palp and lobes, third lobe with some Zahnborsten. × 400.
2. P I. × 400.
3. Anterior margin of left valve. × 160.
4. Mandible palp, detail of α, β and γ bristles. × 400.
5. Antennule, six terminal segments. × 400.
6. *Cyprilla arcuata* Sars, 1924; SAM–A11158; ovigerous ♀; antennule, six terminal segments. × 400.
7. Internal view left valve. × 160.
8. Maxillule palp. × 400.
9. P II. × 400.
10. Antenna, first endopod segment. × 400.
11. P III. × 400.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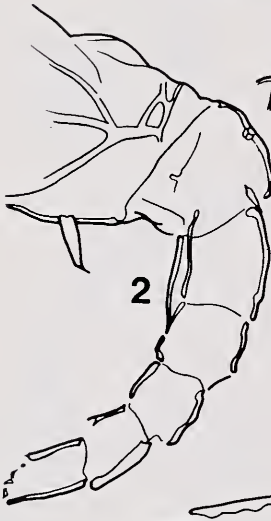
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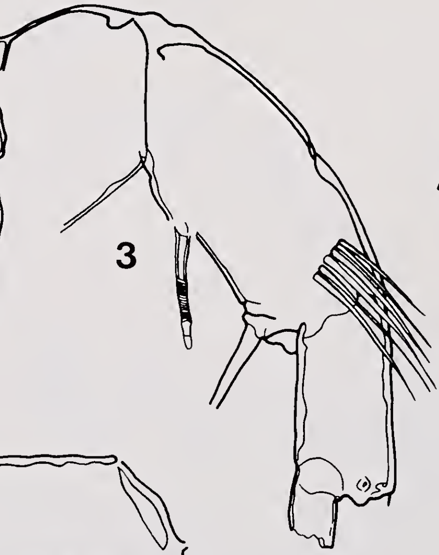
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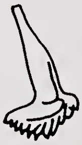
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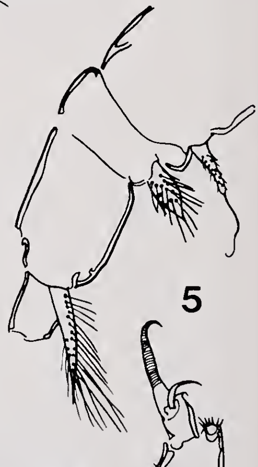
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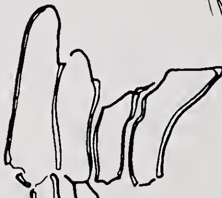
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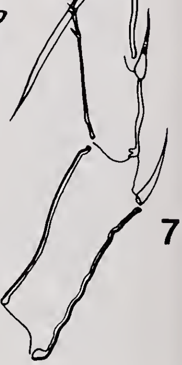
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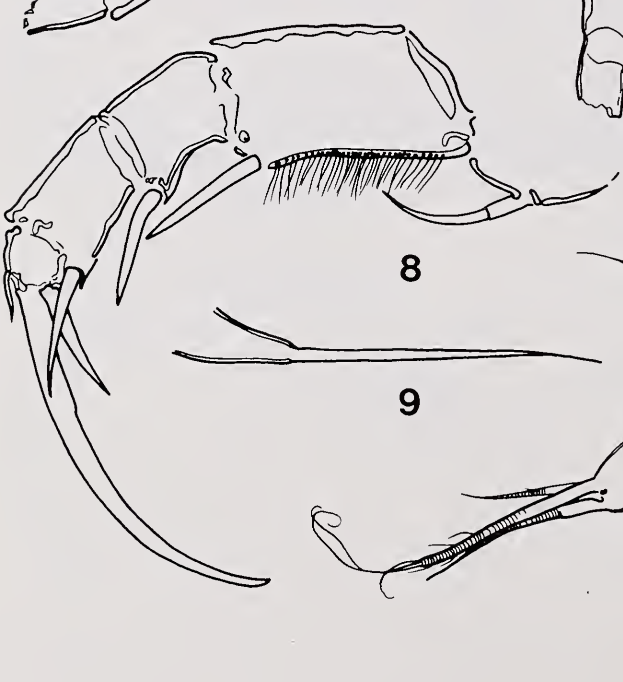
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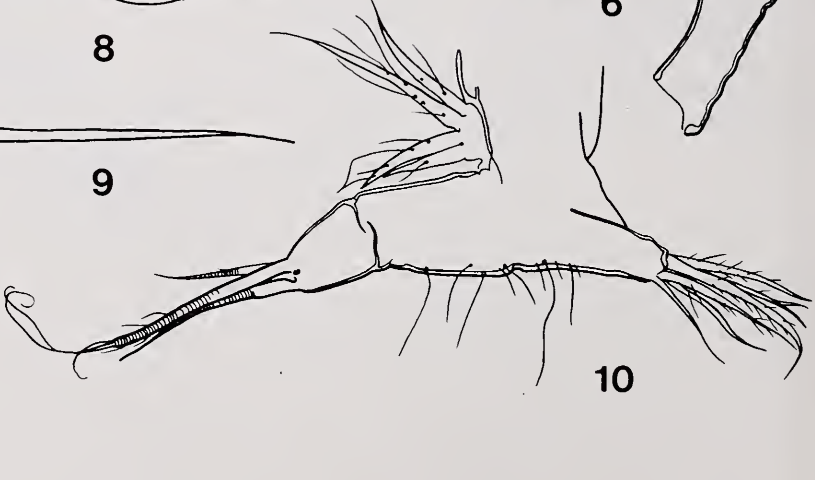
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Fig. 6

1. *Kapcypridopsis barnardi* McKenzie, 1977; SAM–A15451; adult ♀ (yellowish form); internal view left valve. × 160.
2. Antennule segments. × 400.
3. Antenna, with 'natatory' setae. × 400.
4. Rake-like organ. × 400.
5. Mandible palp, detail of α, β and γ bristles. × 400.
6. Maxillule palp and lobes. × 400.
7. P III, terminal segments. × 400.
8. P II. × 400.
9. Furca. × 400.
10. P I. × 400.

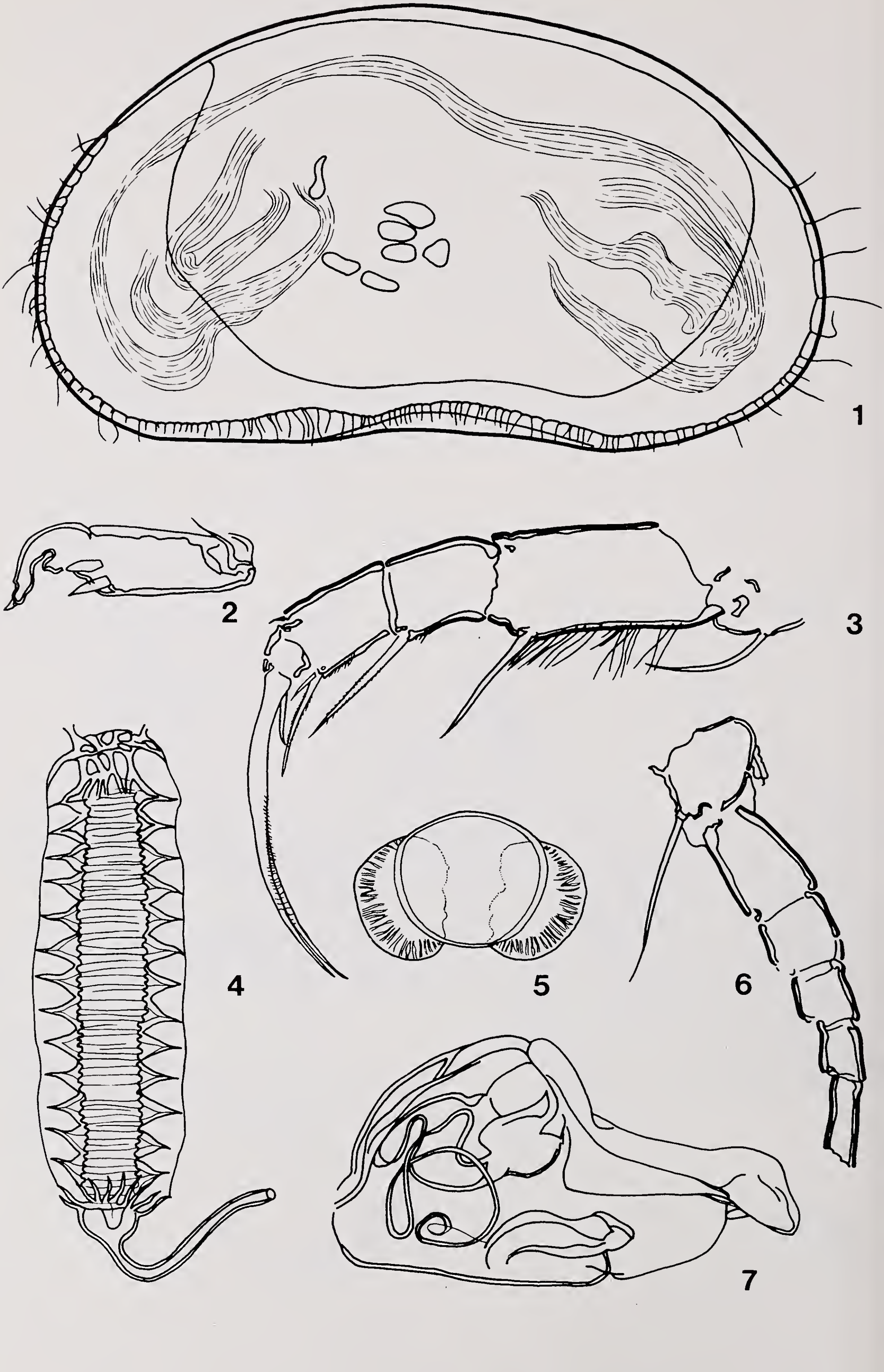


Fig. 7

1. *Kapcypridopsis barnardi* McKenzie, 1977; SAM–A15451; adult ♂ (greenish form); internal view right valve. × 160.
2. P I right palp. × 400.
3. P II. × 400.
4. Zenkers Organ. × 400.
5. Eye. × 400.
6. Antennule, six terminal segments. × 400.
7. Hemipenis. × 400.

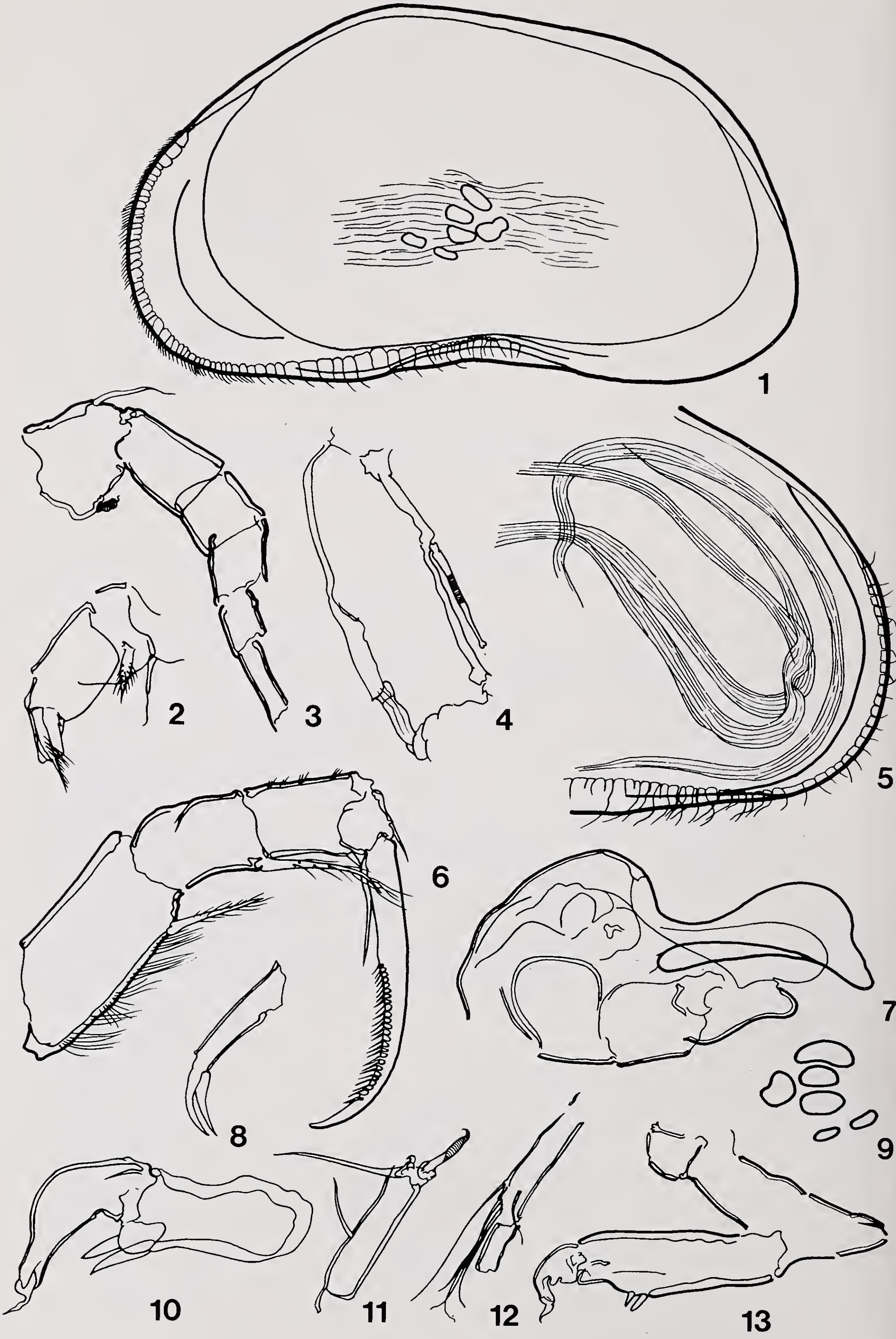


Fig. 8

1. *Sarscypridopsis striolata* (Sars, 1924); SAM–A11201; ovigerous ♀; internal view right valve. × 160.
2. *Sarscypridopsis ochracea* (Sars, 1924); SAM–A11220; adult ♂; mandible palp detail α, β and γ bristles. × 400.
3. Antennule, six terminal segments. × 400.
4. Antenna, first endopod segment with sensory bristle. × 400.
5. Posteroventral right valve. × 160.
6. P II. × 400.
7. Hemipenis. × 400.
8. Maxillule third lobe with Zahnborsten. × 400.
9. Muscle scars. × 160.
10. P I, left palp. × 400.
11. P III, terminal segment. × 400.
12. Maxillule palp. × 400.
13. P I, right palp. × 400.

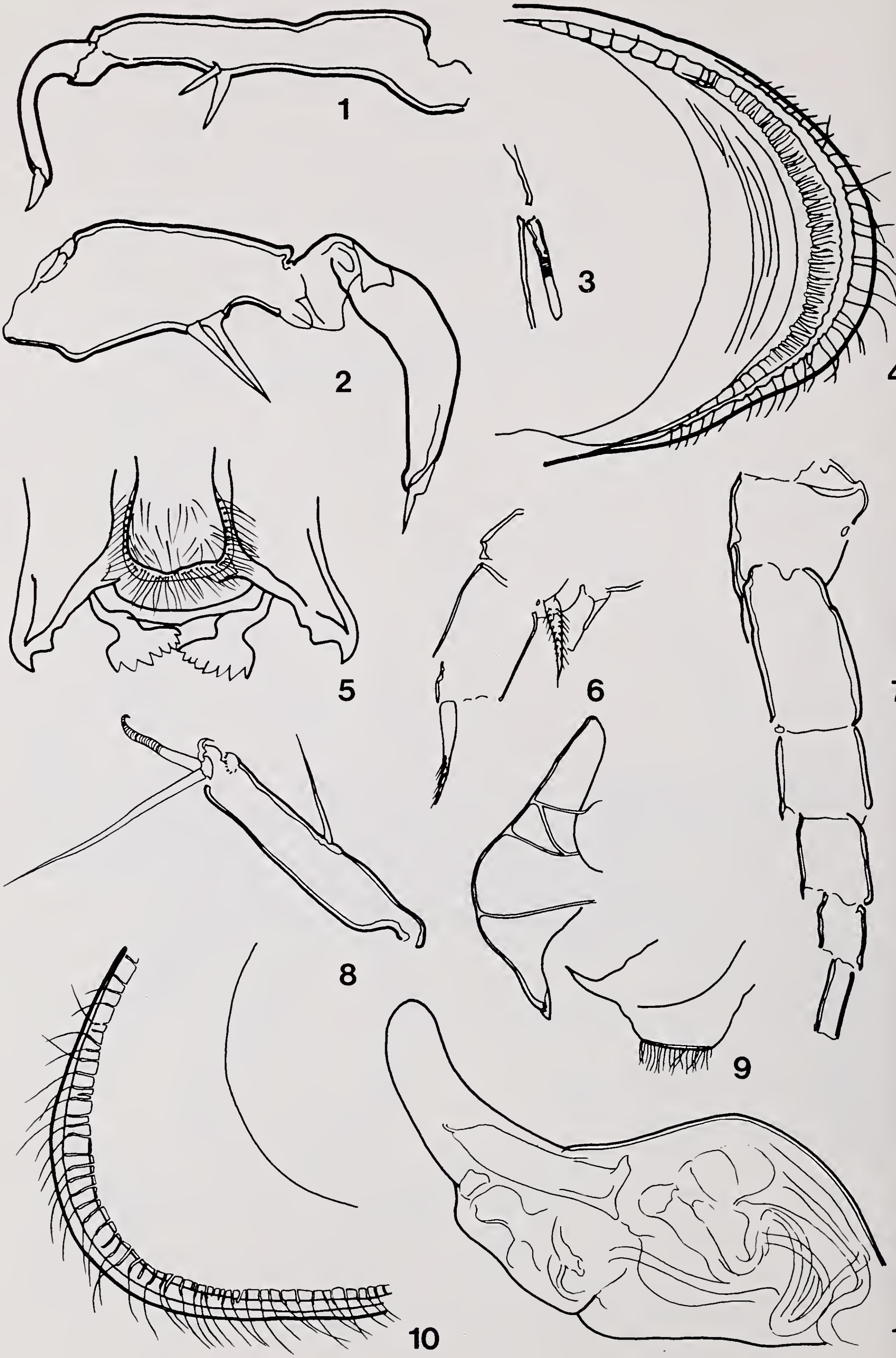


Fig. 9

1. *Plesiocypridopsis* cf. *aldabrae* (Müller, 1898); SAM–A5940; adult ♂; P I right palp. × 400.
2. P I left palp. × 400.
3. Antenna, sensory bristle first endopod segment. × 400.
4. *Zonocypris cordata* Sars, 1924; SAM–A11144; ovigerous ♀; anterior margin left valve. × 160.
5. *Plesiocypridopsis* cf. *aldabrae* (Müller, 1898); SAM–A5940; adult ♀; ventral view of labia with rake-like organs. × 400.
6. Mandible palp, detail of α, β and γ bristles. × 400.
7. Antennule, six terminal segments. × 400.
8. P III, terminal segment. × 400.
9. Adult ♂; head and oral region. × 160.
10. Anteroventral right valve. × 160.
11. Hemipenis. × 400.

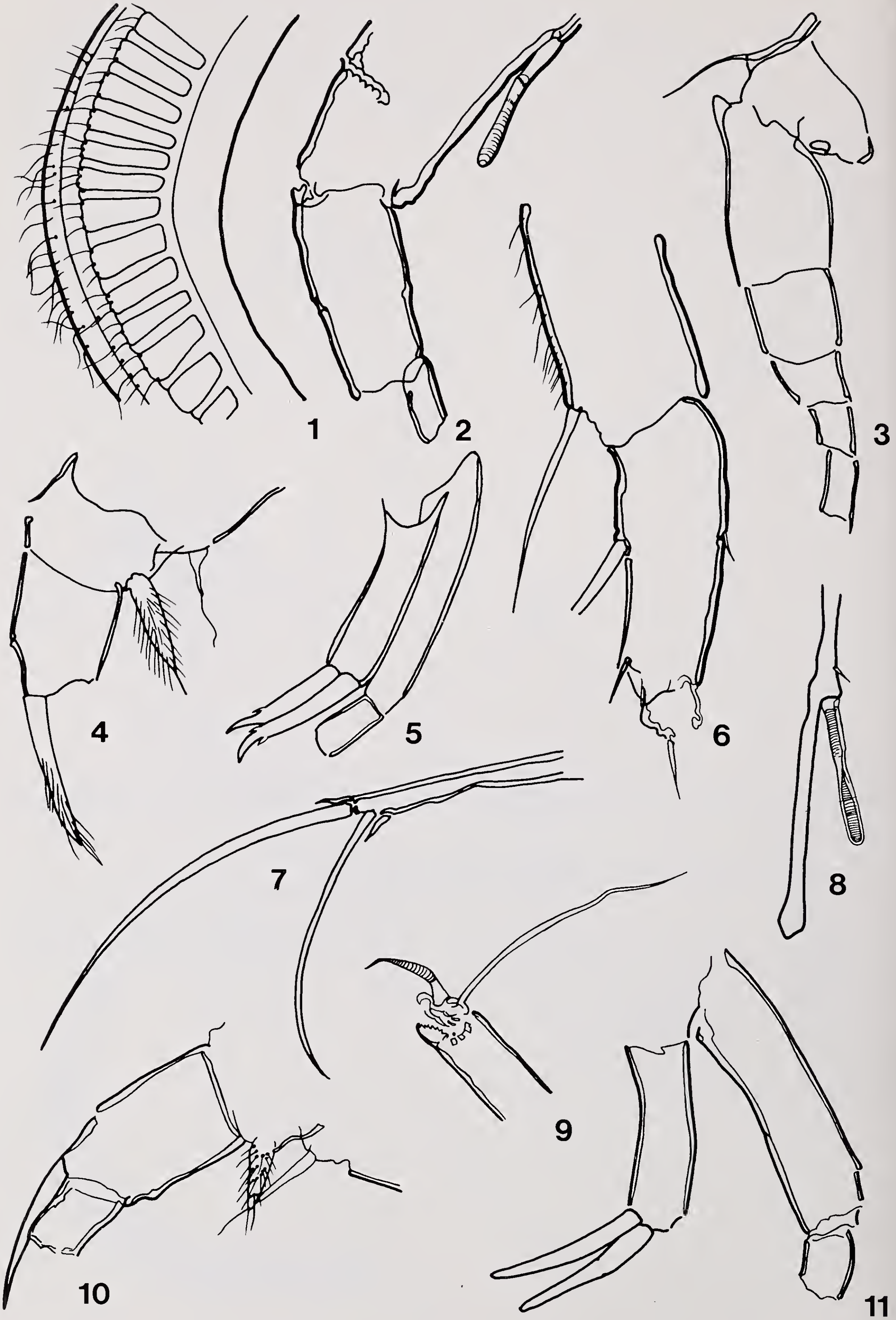
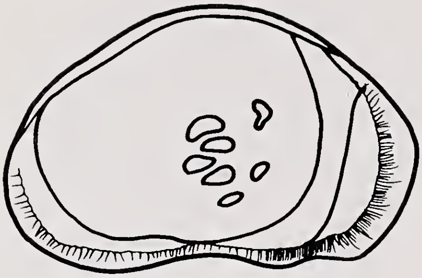


Fig. 10

1. *Cypretta* cf. *turgida* (Sars, 1895); SAM–A11159; ovigerous ♀; anterior margin right valve with radial septa. × 160.
2. Antenna endopod segments with sensory bristle. × 400.
3. Antennule six terminal segments. × 400.
4. Mandible palp, detail of α, β and γ bristles. × 400.
5. Maxillule palp and third lobe with Zahnborsten. × 400.
6. P I, terminal segments. × 400.
7. Distal furca. × 400.
8. *Paracypretta ampullacea* Sars, 1924; SAM–A11278; ovigerous ♀; sensory bristle first endopod segment of antenna. × 400.
9. P III, distal terminal segment. × 400.
10. Mandible palp, detail of α, β and γ bristles. × 400.
11. Maxillule palp and third lobe with Zahnborsten. × 400.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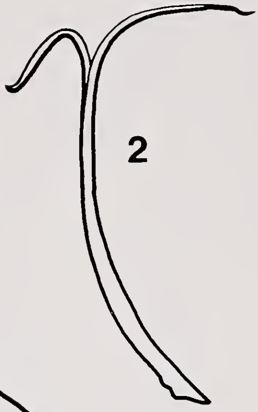
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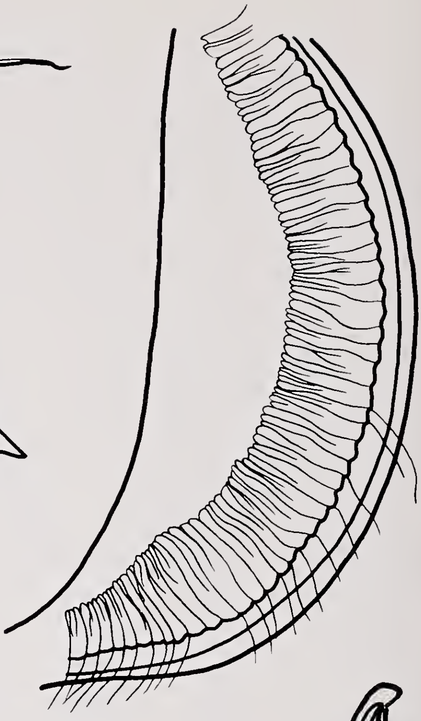
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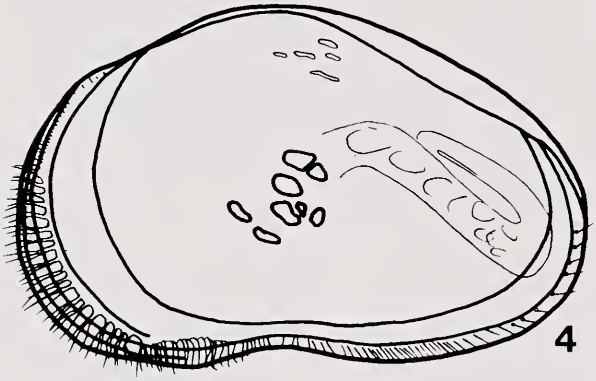
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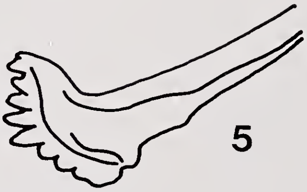
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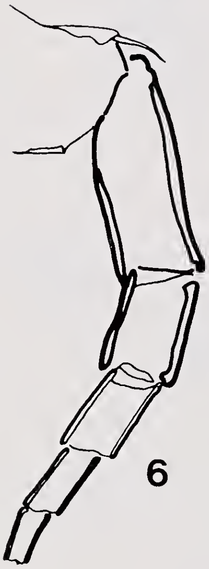
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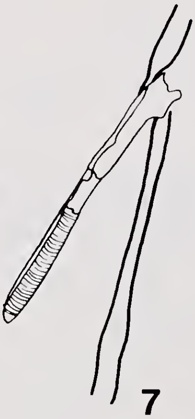
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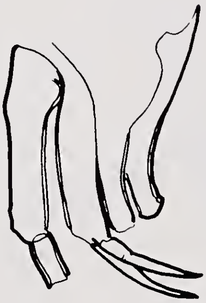
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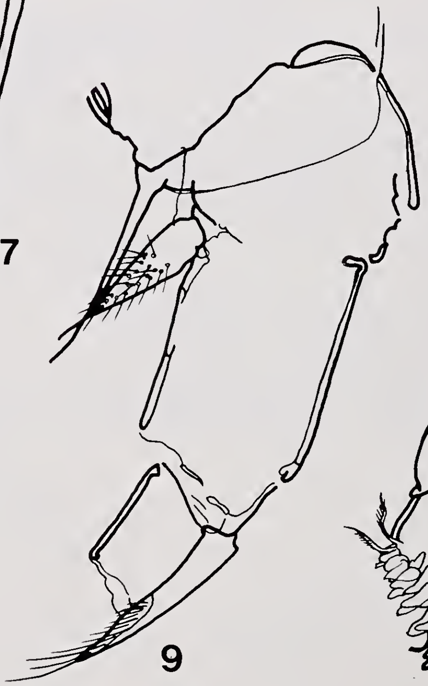
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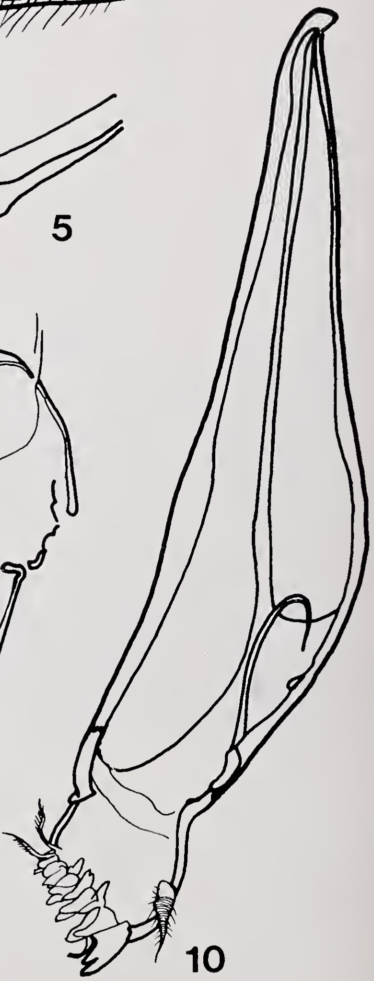
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Fig. 11

1. *Paracypretta ampullacea* Sars, 1924; SAM–A11278; ovigerous ♀; internal view left valve. × 40.
2. Chitin support. × 160.
3. Detail anterior margin radial pore canals left valve. × 160.
4. *Bradycypris intumescens* (Brady, 1907); SAM–A11299; ovigerous ♀; internal view right valve, showing radial septa. × 40.
5. Rake-like organ. × 400.
6. Antennule, six terminal segments. × 160.
7. Antenna, sensory bristle first endopod segment. × 400.
8. Maxillule palp and lobes, third lobe with Zahnborsten. × 160.
9. Mandible palp, detail of α, β and γ bristles. × 400.
10. Mandible coxale. × 160.

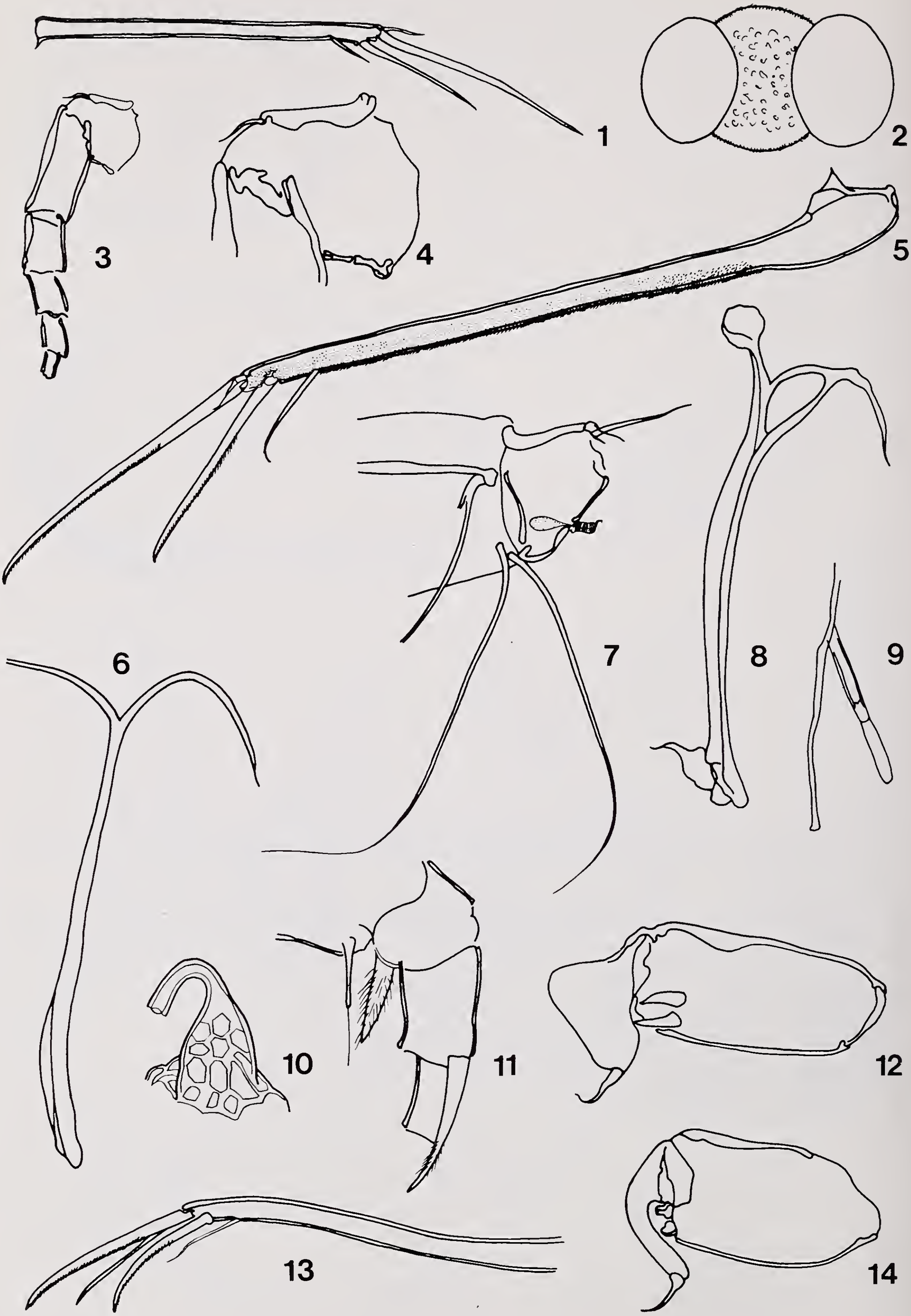
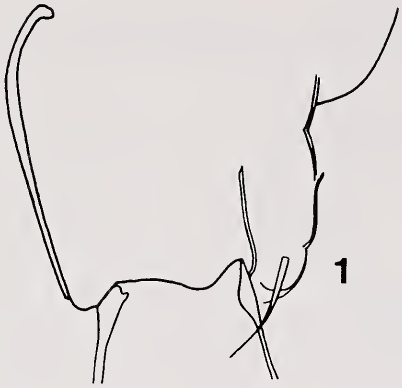


Fig. 12

1. *Paracypretta ampullacea* Sars, 1924; SAM–A11278; ovigerous ♀; furca. × 160.
2. Eye. × 400.
3. Antennule, terminal six segments. × 160.
4. Antennule, detail second segment. × 400.
5. *Bradycypris intumescens* (Brady, 1907); SAM–A11299; ovigerous ♀; furca. × 160.
6. Chitin support. × 160.
7. *Cypricercus cuneatus* Sars, 1896; SAM–A11140; adult ♂; antennule, detail first and second segments with gland and chemo-receptor. × 400.
8. Chitin support. × 160.
9. Antenna, sensory bristle of first endopod segment. × 400.
10. Cap of Zenkers Organ. × 400.
11. Mandible palp, detail of α, β and γ bristles. × 400.
12. P I, right palp. × 400.
13. Furca. × 160.
14. P I, left palp. × 400.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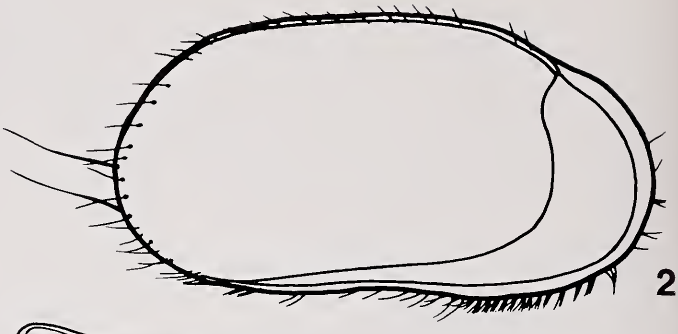
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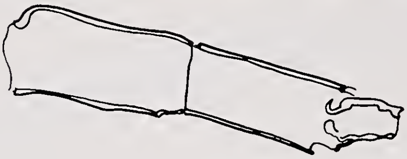
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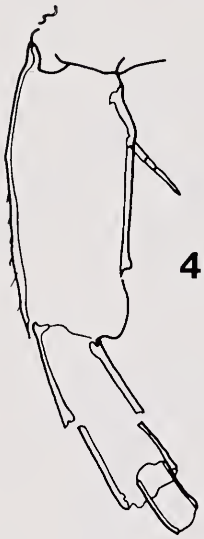
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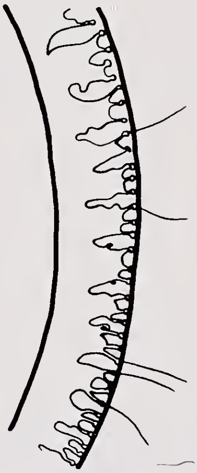
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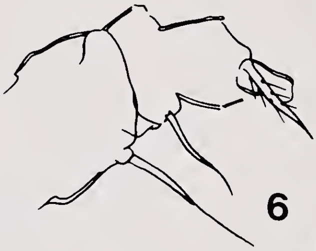
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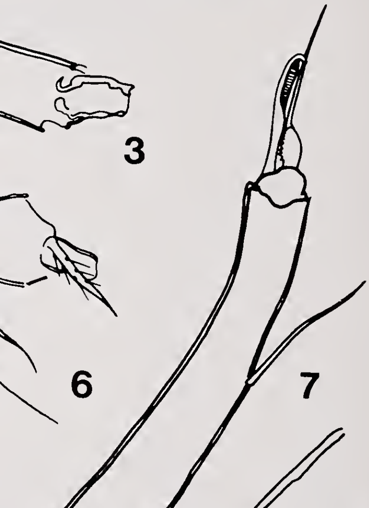
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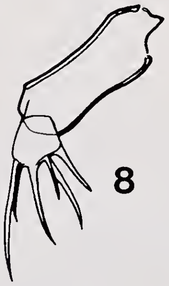
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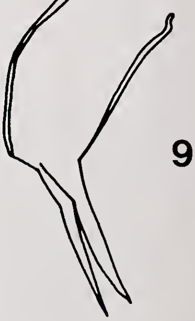
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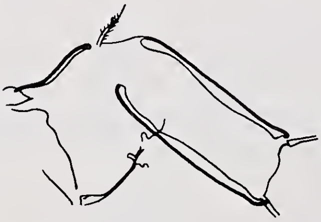
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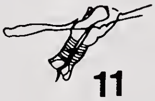
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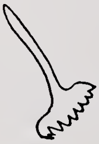
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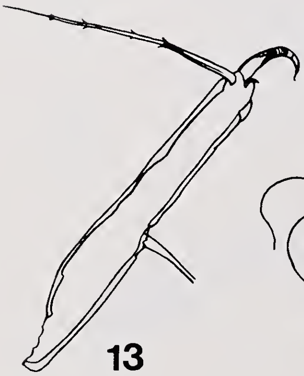
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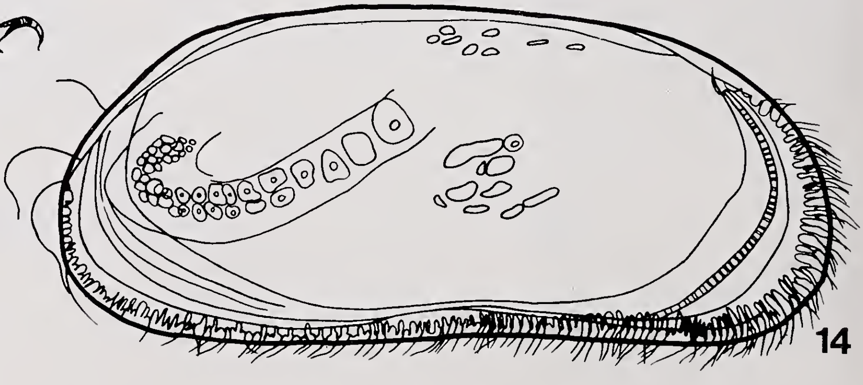
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Fig. 13

1. *Isocypris priomena* Müller, 1908; SAM–A11177; ovigerous ♀; antennule second segment. × 400.
2. Internal view left valve. × 40.
3. P II, three terminal segments. × 160.
4. Antenna endopod segments. × 160.
5. Anterior margin, detail radial pore canals. × 160.
6. Mandible palp, detail of α, β and γ bristles. × 160.
7. P III terminal segment. × 400.
8. Maxillule palp. × 160.
9. Maxillule third lobe with Zahnborsten. × 160.
10. *Herpetocypris chevreuxi* (Sars, 1896); SAM–A1148; ovigerous ♀; antennule second and third segments. × 160.
11. Antennule second segment chemo-receptor. × 400.
12. Rake-like organ. × 160.
13. P III, terminal segment. × 160.
14. Internal view left valve. × 40.

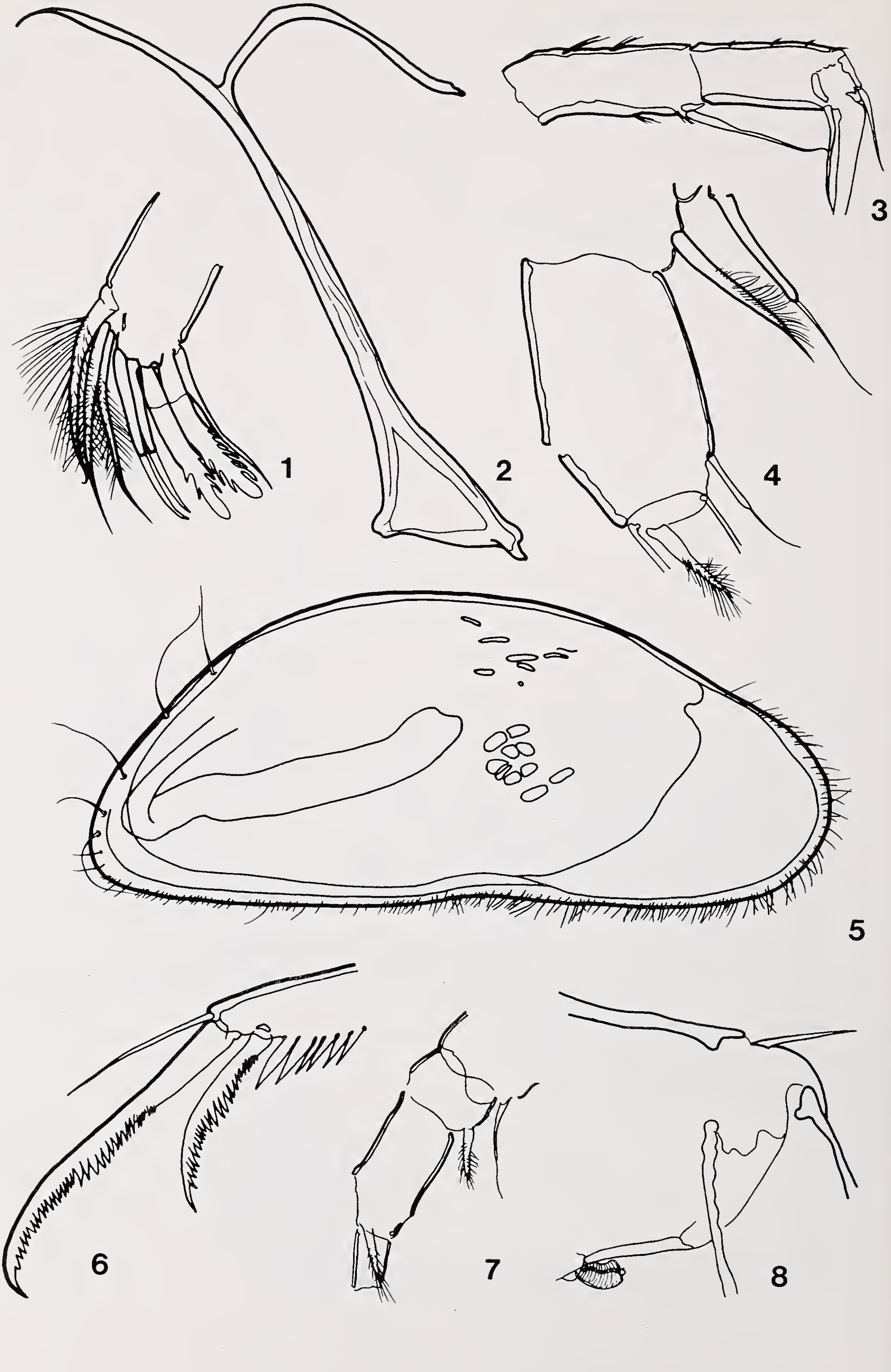


Fig. 14

1. *Herpetocypris chevreuxi* (Sars, 1896); SAM–A1148; ovigerous ♀; maxillule third lobe. × 400.
2. Chitin support. × 160.
3. P I, terminal segments and part of claw. × 160.
4. Mandible palp, detail of α, β and γ bristles. × 400.
5. *Parastenocypris declivis* (Sars, 1924); SAM–A3797; ovigerous ♀; internal view, left valve. × 40.
6. Distal furca. × 160.
7. Mandible palp, detail of α, β and γ bristles. × 160.
8. Antennule second segment with chemo-receptor. × 400.

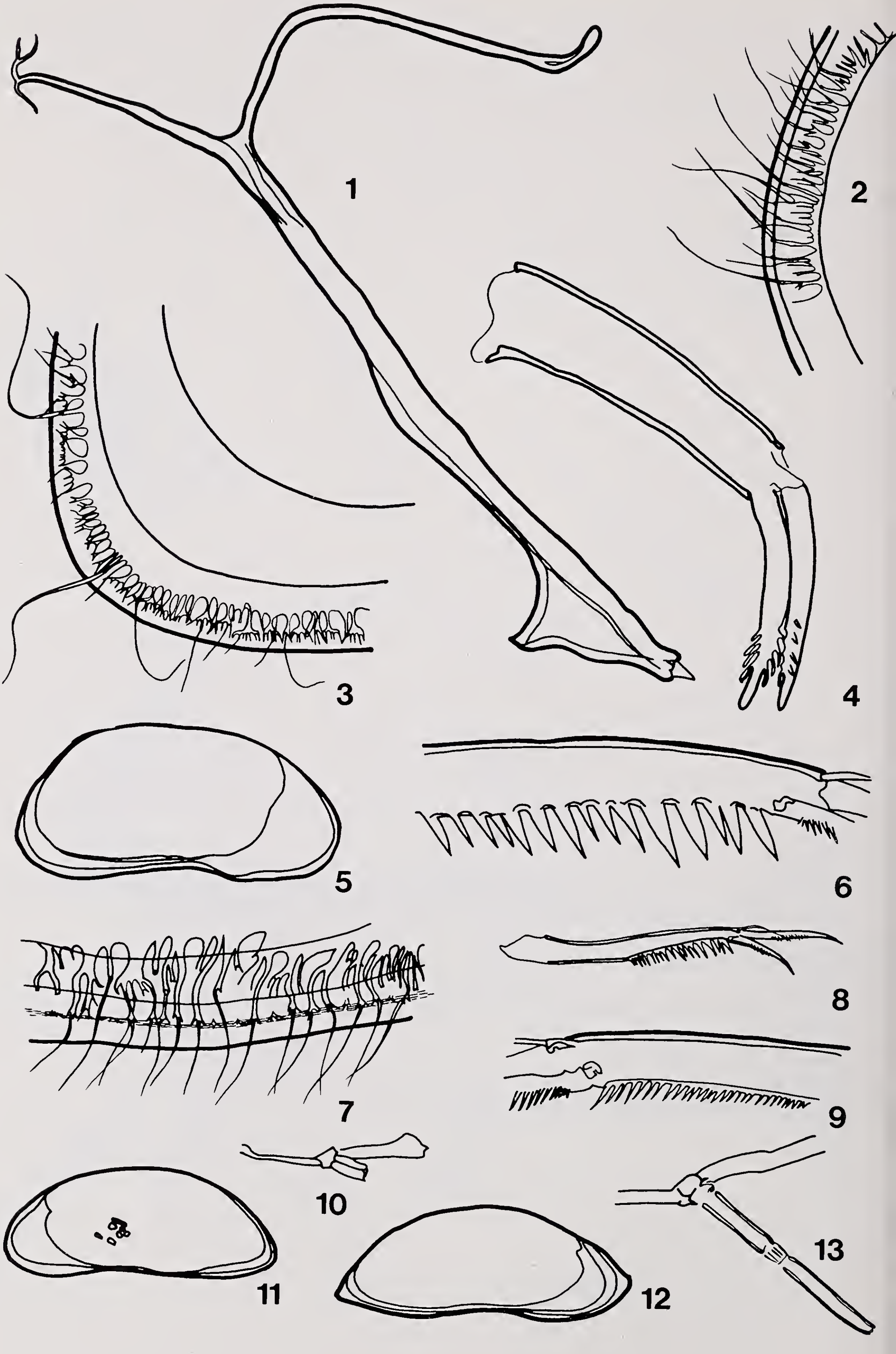
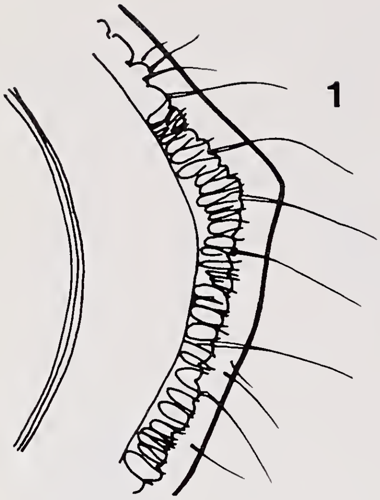


Fig. 15

1. *Parastenocypris declivis* (Sars, 1924); SAM–A3797; adult ♀; chitin support. × 160.
2. Detail anterior margin left valve. × 160.
3. Detail posteroventral margin left valve. × 160.
4. Maxillule third lobe with Zahnborsten. × 400.
5. *Parastenocypris hodgsoni* (Sars, 1924); SAM–A11126; ovigerous ♀; internal view left valve. × 16.
6. Furca, detail of posterior margin. × 160.
7. Detail anteroventral margin left valve. × 160.
8. Furca. × 40.
9. Furca, other ramus. × 160.
10. Antennule, detail of second segment chemo-receptor. × 400.
11. *Parastenocypris pardalis* (Sars, 1924); SAM–A11167; internal view right valve. × 16.
12. Internal view left valve. × 16.
13. Antenna, sensory bristle of basal endopod segment. × 400.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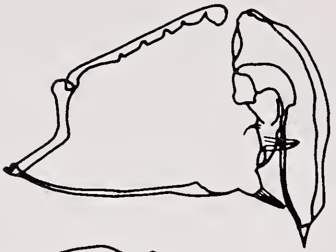
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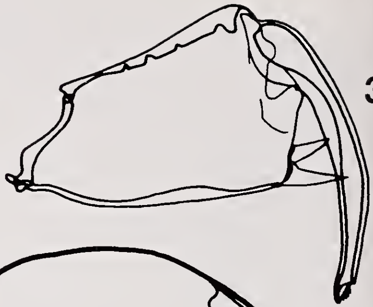
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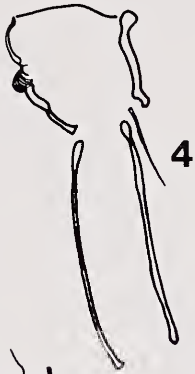
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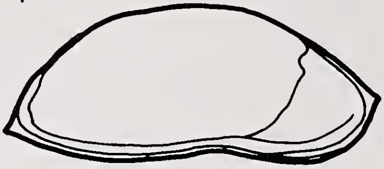
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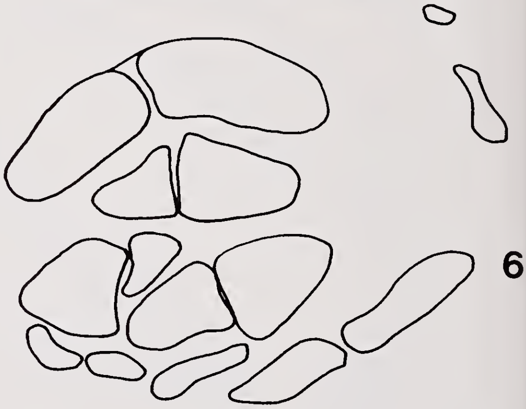
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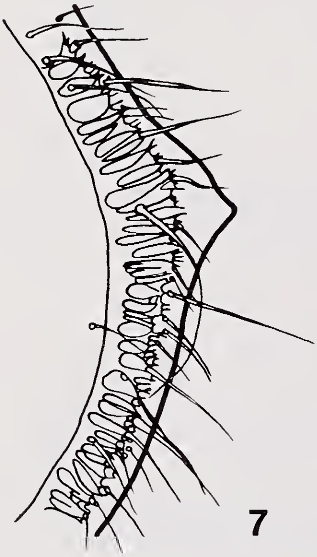
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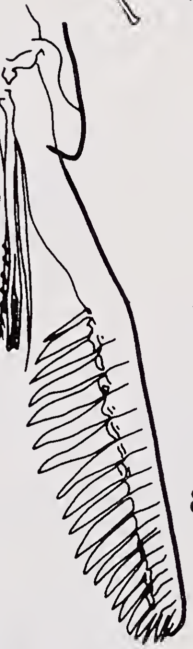
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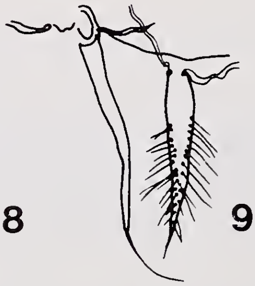
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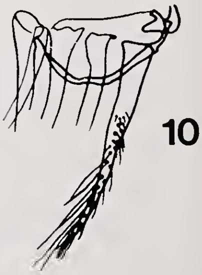
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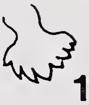
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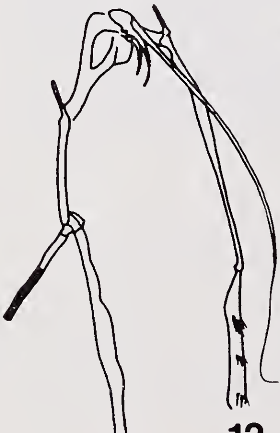
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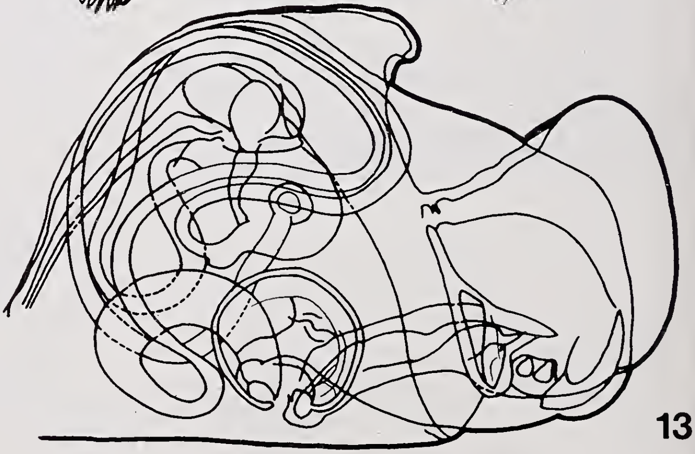
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Fig. 16

1. *Parastenocypris pardalis* (Sars, 1924); SAM–A11167; adult ♂; detail anterior margin left valve. × 160.
2. P I, left palp. × 160.
3. P I, right palp. × 160.
4. Antennule second and third segments. × 160.
5. *Parastenocypris olivacea* (Sars, 1924); SAM–A3797; adult ♂; internal view left valve. × 16.
6. Muscle scars. × 160.
7. Detail anterior margin left valve. × 160.
8. Antenna terminal segment, detail of comb bristle. × 400.
9. Mandible palp, detail of α and β bristles. × 400.
10. Mandible palp, detail of γ bristle. × 400.
11. Terminal rake-like organ. × 160.
12. Antenna basal endopod segment, showing exopod and sensory bristle. × 400.
13. Hemipenis. × 160.

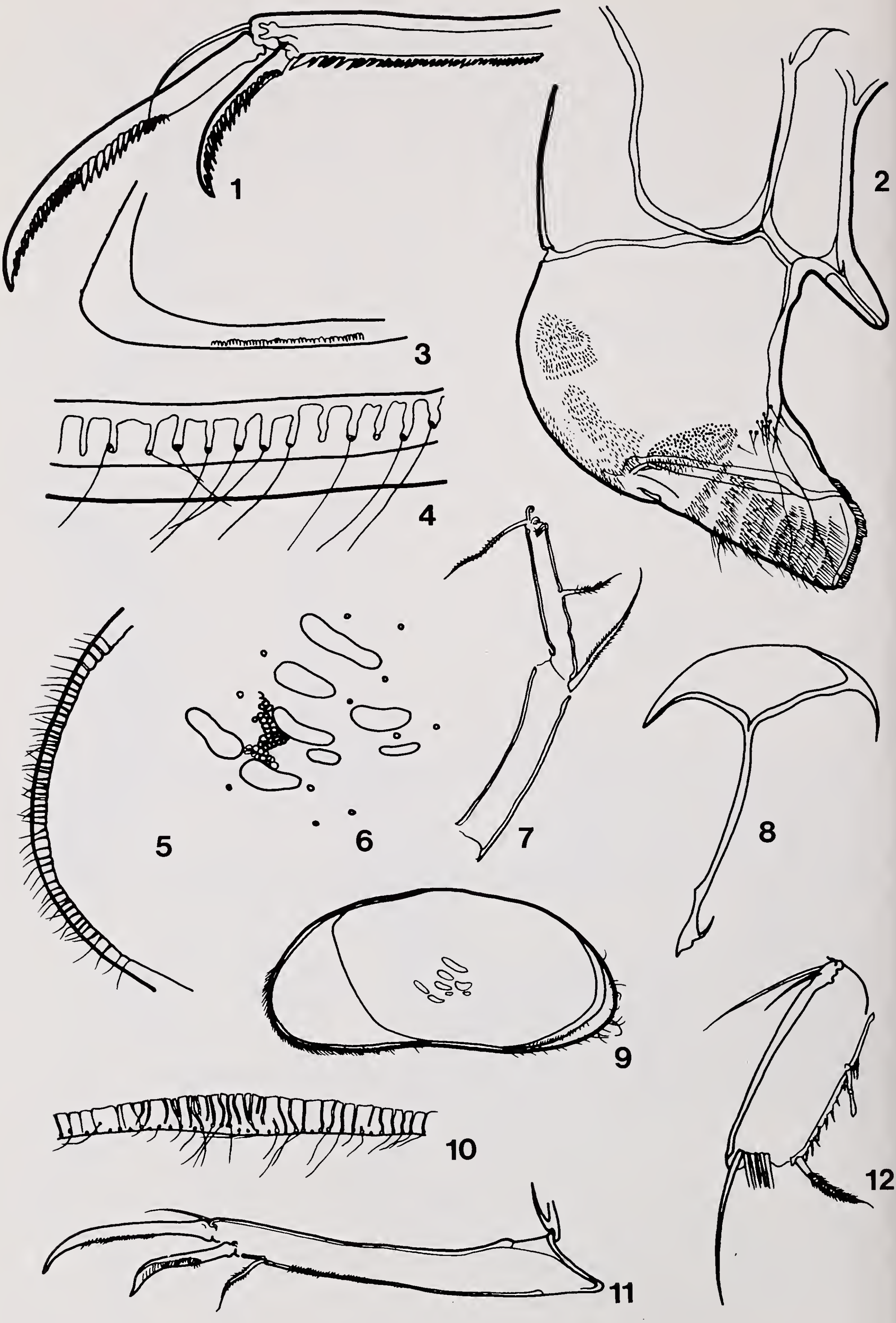

Fig. 17

1. *Parastenocypris olivacea* (Sars, 1924); SAM–3793; adult ♂; distal furca. × 160.
2. Frontal head region and labrum. × 160.
3. ?*Chrissia fascigera* (Sars, 1924); SAM–A11361; adult ♀; internal view posteroventral left valve. × 160.
4. Anteroventral margin left valve, showing simple nature of radial pore canals. × 400.
5. *Homocypris conoidea* Sars, 1924; SAM–A11170; adult ♀; detail anterior margin right valve. × 160.
6. Muscle scars and detail of shell microstructure. × 160.
7. P III, terminal segments. × 160.
8. Chitin support. × 160.
9. Internal view right valve. × 40.
10. Detail anteroventral margin right valve. × 160.
11. Furca. × 160.
12. Antenna basal endopod segment, showing exopod, sensory bristle and part of the 'natatory' setae. × 160.

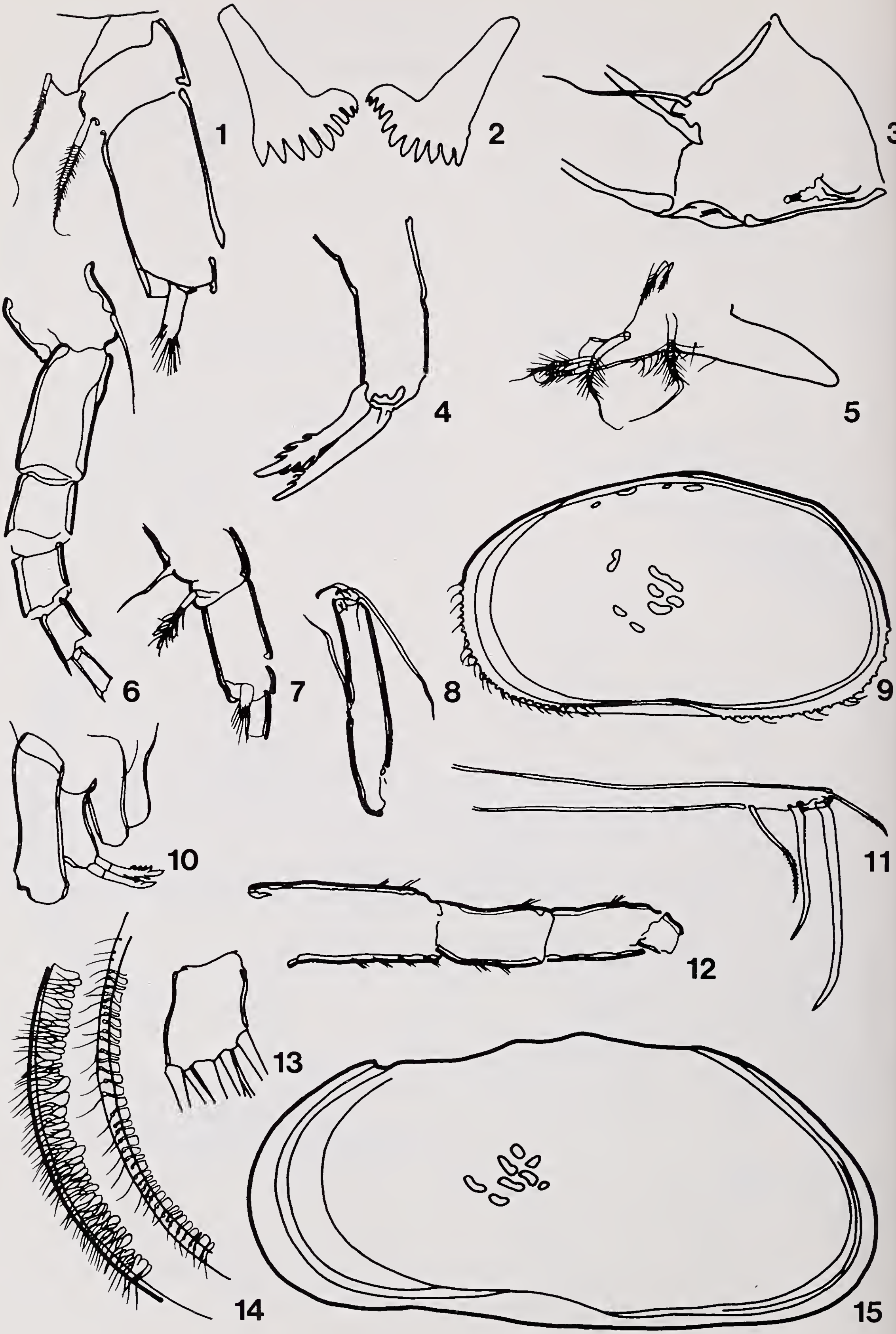

Fig. 18

1. *Homocypris conoidea* Sars, 1924; SAM–A11170; adult ♀; mandible palp, detail of α, β and γ bristles. × 400.
2. Rake-like organs. × 400.
3. Antennule, detail second segment. × 400.
4. Maxillule third lobe with Zahnborsten. × 400.
5. P I, endopod and exopod, several bristles not shown. × 160.
6. *Heterocypris aurea* (Sars, 1896); SAM–A11310; ovigerous ♀; antennule, terminal six segments. × 160.
7. Mandible palp, detail of α, β and γ bristles. × 160.
8. P III, terminal segment. × 160.
9. Internal view right valve. × 40.
10. Maxillule palp and lobes, third lobe with Zahnborsten. × 160.
11. Furca. × 160.
12. P II, four terminal segments. × 160.
13. *Afrocypris barnardi* Sars, 1924; SAM–A11291; ovigerous ♀; maxillule palp, second segment. × 160.
14. Detail, anterior margin right valve. × 40.
15. Internal view right valve. × 16.

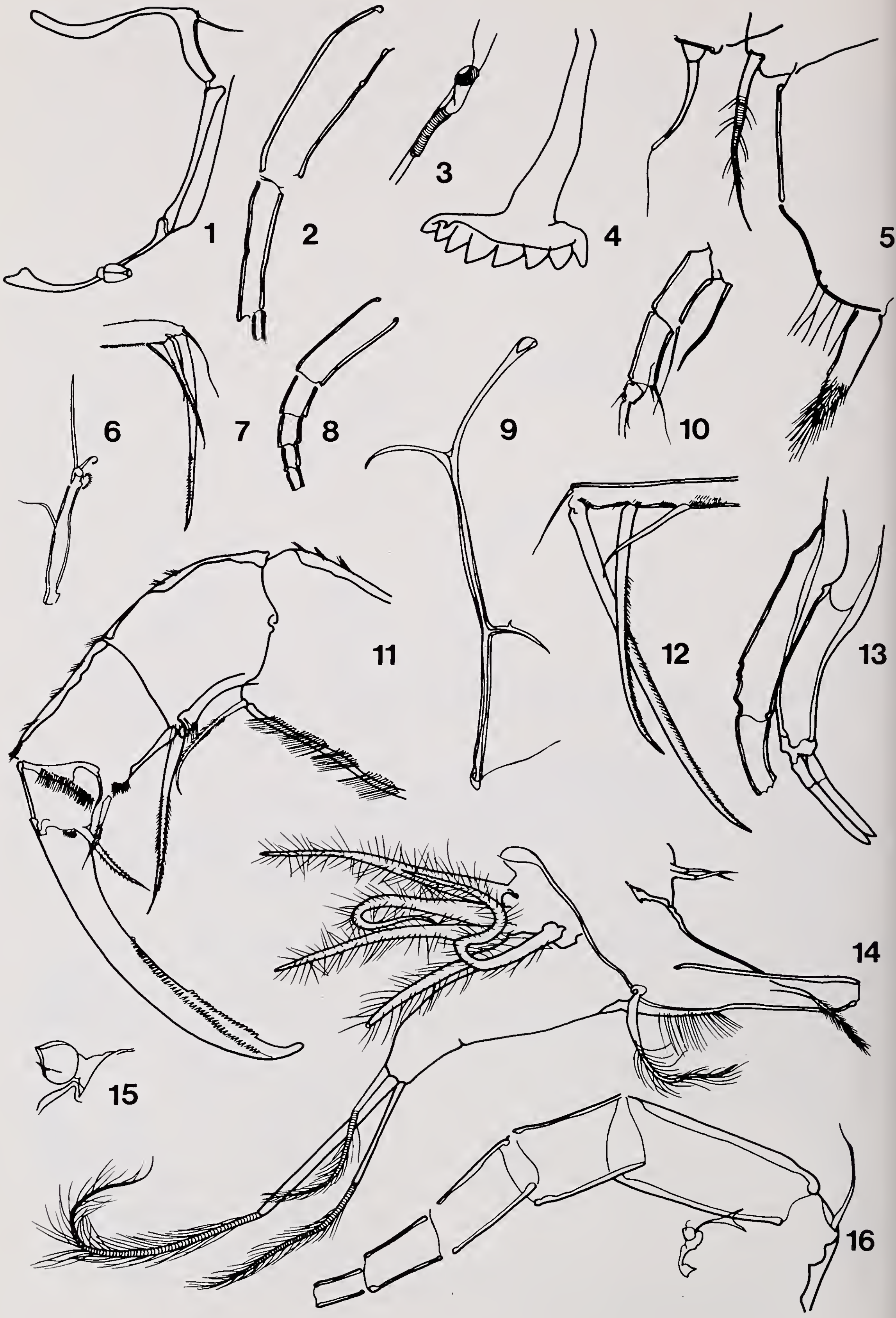

Fig. 19

1. *Afrocypris barnardi* Sars, 1924; SAM–A11291; ovigerous ♀; antennule, detail of second segment. × 160.
2. Antenna, endopod segments. × 40.
3. Antenna, detail of sensory bristle on basal endopod segment. × 160.
4. Rake-like organ. × 160.
5. Mandible palp, detail of α, β and γ bristles. × 160.
6. P III, terminal segment. × 40.
7. Distal furca. × 40.
8. Antennule, five terminal segments. × 40.
9. Chitin support. × 40.
10. P II, three terminal segments. × 40.
11. *Eucypris purcelli* Sars, 1924; SAM–A11287; adult ♀; P II. × 160.
12. Distal furca. × 160.
13. Maxillule palp and third lobe showing Zahnborsten. × 160.
14. P I, exopod bristles not shown. × 160.
15. Antennule, detail of chemo-receptor. × 400.
16. Antennule, six terminal segments. × 160.

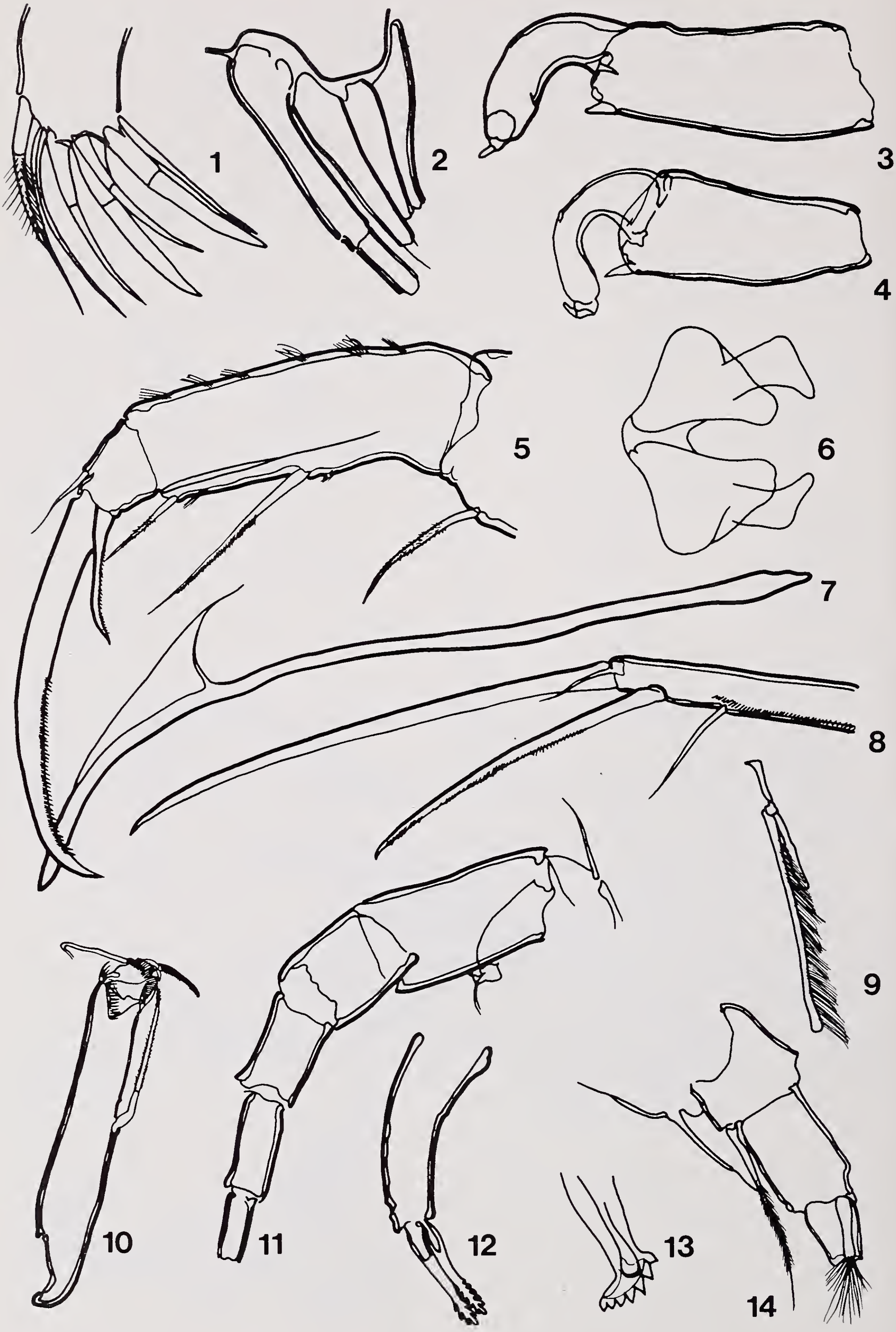

Fig. 20

1. *Afrocypris barnardi* Sars, 1924; SAM A11291; ovigerous ♀; maxillule third lobe. × 160.
2. *Pseudocypris triquetra* Sars, 1924; SAM–A11211; adult ♂; maxillule palp and lobes. × 160.
3. P I, right palp. × 160.
4. P I, left palp. × 160.
5. P II, two terminal segments and claw. × 160.
6. Outline hemipenes. × 40.
7. Chitin support. × 160.
8. Distal furca. × 160.
9. Antenna, sensory bristle. × 160.
10. P III, distal segment. × 160.
11. Antennúle, six distalmost segments. × 160.
12. Maxillule third lobe showing Zahnborsten. × 160.
13. Rake-like organ. × 160.
14. Mandible palp, detail α, β and γ bristles. × 160.

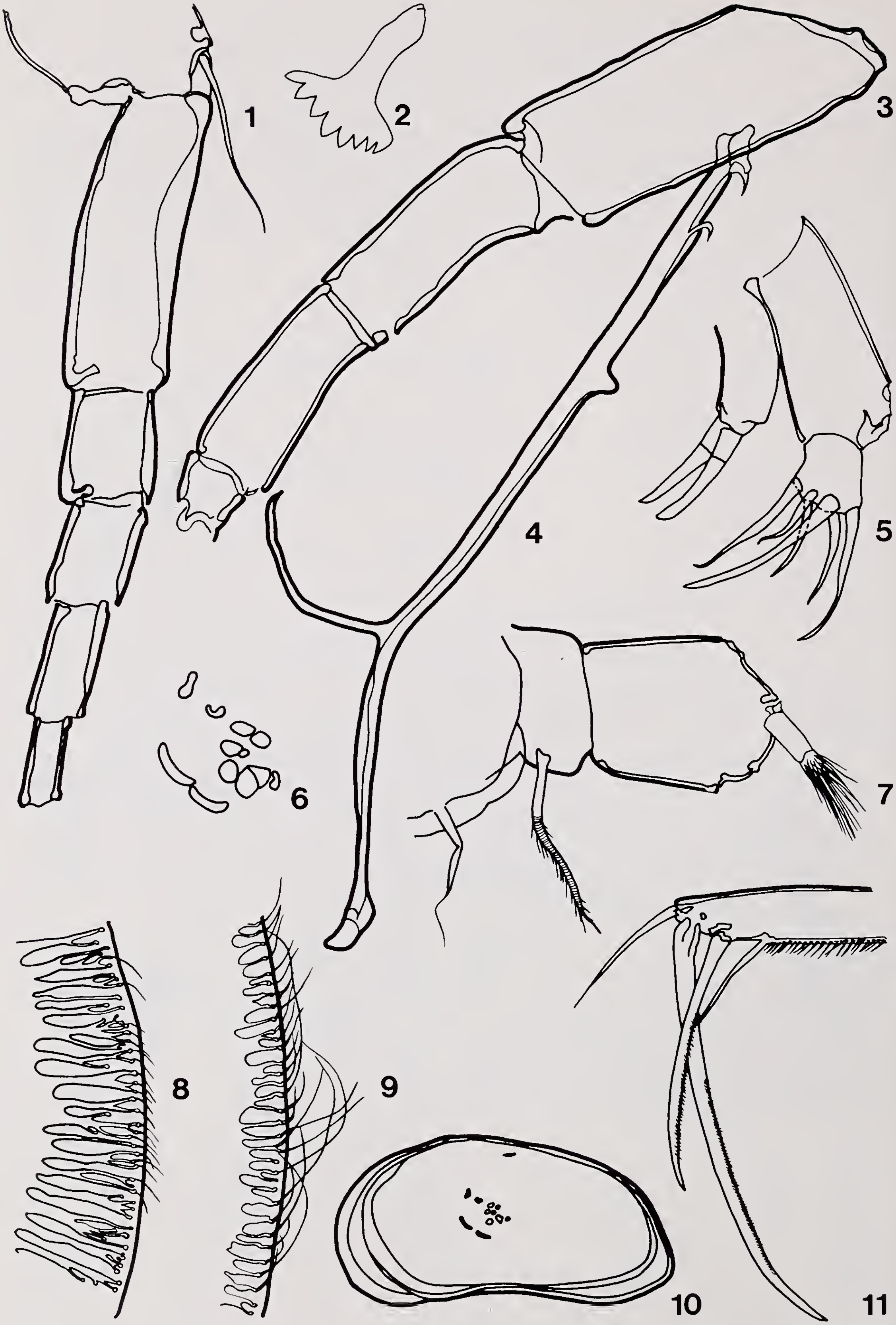

Fig. 21

1. *Sclerocypris clavularis* Sars, 1924; SAM–A11118; ovigerous ♀; antennule, six distalmost segments. × 160.
2. Rake-like organ. × 160.
3. P I, four terminal segments. × 160.
4. Chitin support. × 160.
5. Maxillule palp and third lobe showing Zahnborsten. × 160.
6. Carapace, muscle scars. × 40.
7. Mandible palp, detail α, β and γ bristles. × 160.
8. Anterior margin left valve. × 160.
9. Anterior margin right valve. × 160.
10. Internal view right valve. × 16.
11. Distal furca. × 160.

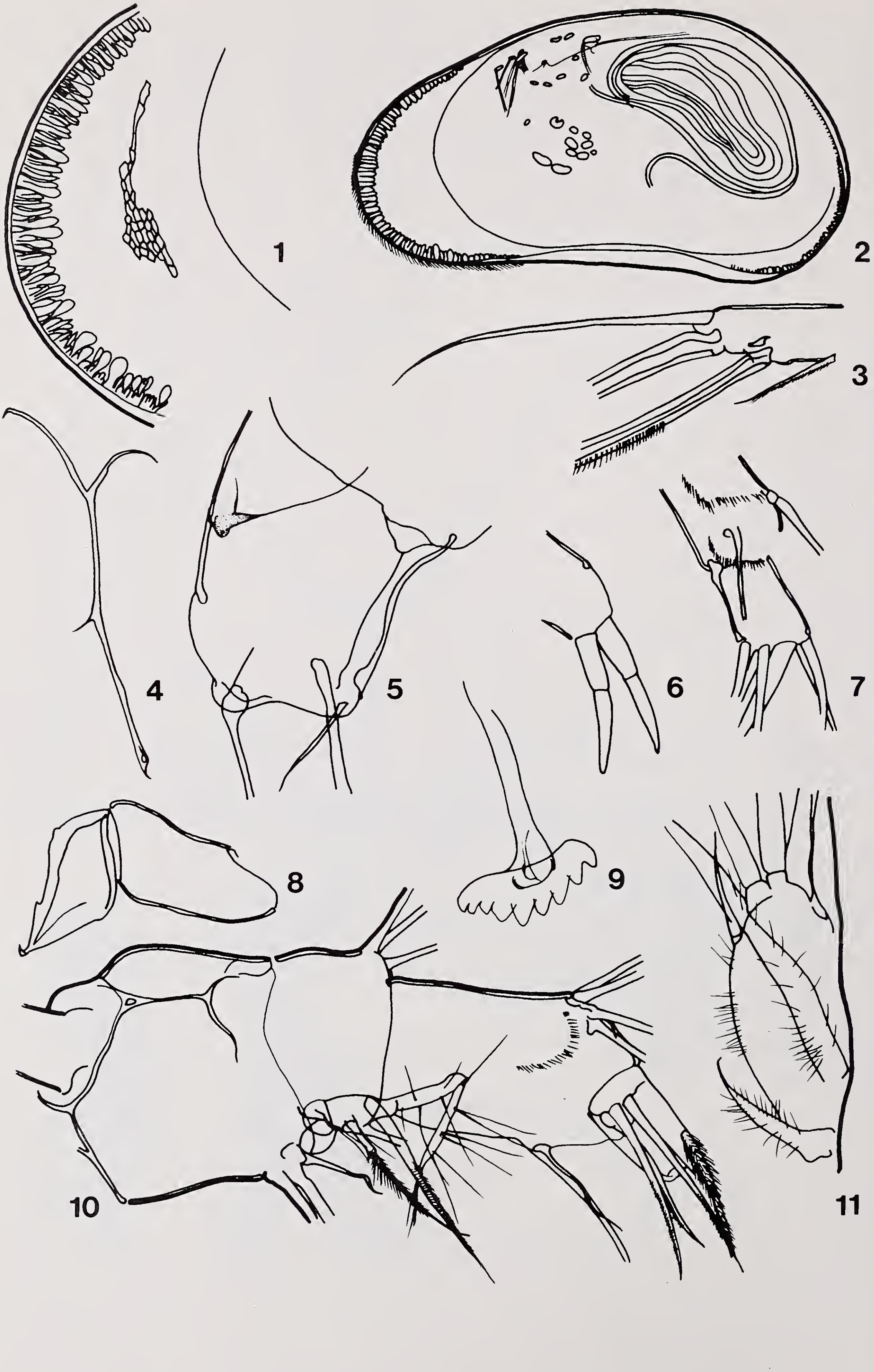

Fig. 22

1. *Liocypris grandis* Sars, 1924; SAM–6281; adult ♂; carapace, detail anterior margin reticulate valve microstructure (in part). × 40.
2. Internal view right valve. × 16.
3. Furca, distal detail. × 160.
4. Chitin support. × 40.
5. Antennule, detail of second segment showing gland and bristle. × 160.
6. Maxillule third lobe with Zahnborsten. × 160.
7. Maxillule palp. × 160.
8. P I palp. × 40.
9. Rake-like organ. × 160.
10. Mandible palp, indicating complexity of setation. × 160.
11. Mandible epipod. × 160.

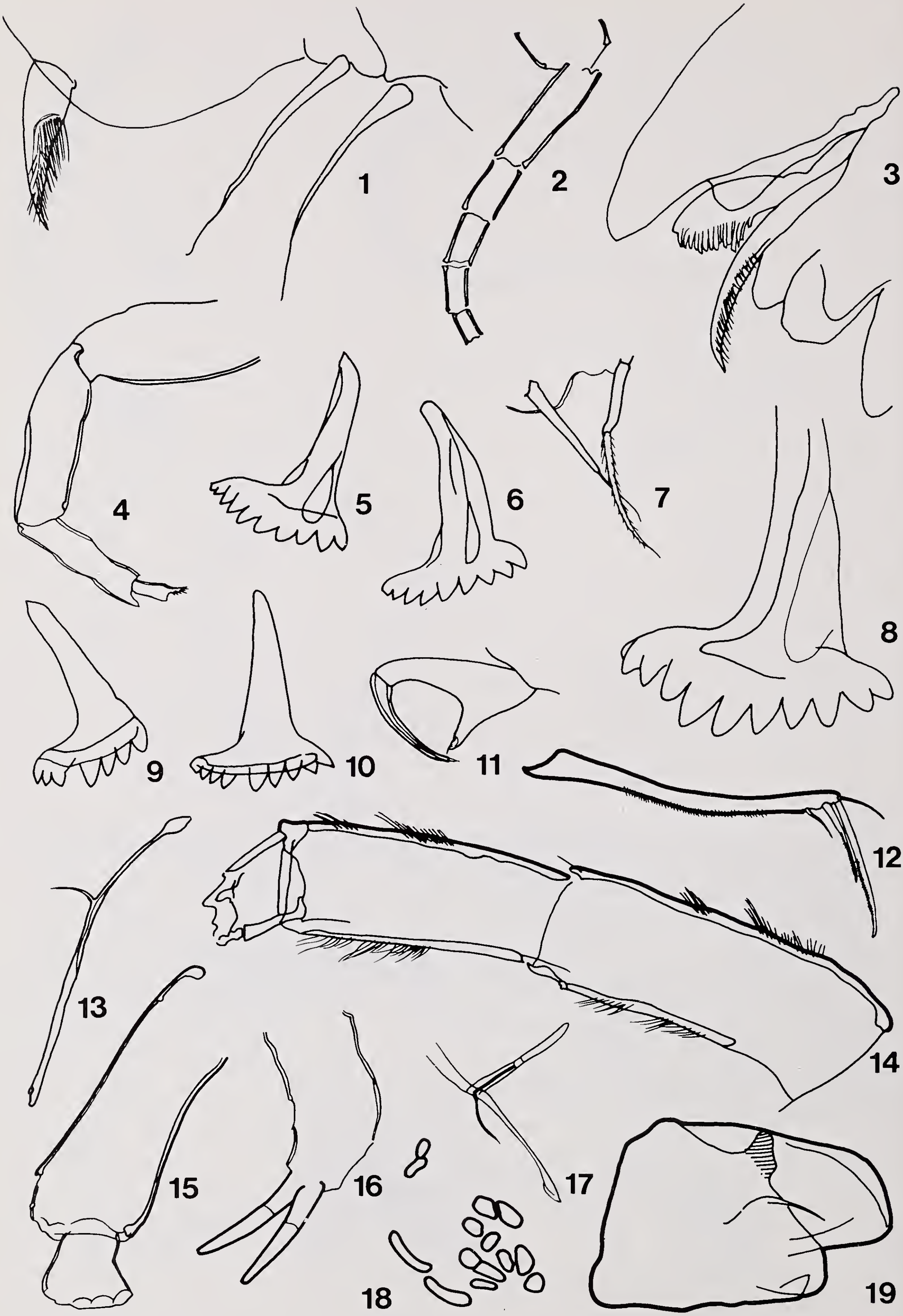

Fig. 23

1. *Megalocypris hispida* Sars, 1924; SAM–A11845; adult ♀; mandible palp, detail of α, β and γ bristles. × 160.
2. SAM–A11844; adult ♂; antennule, six distalmost segments. × 40.
3. SAM–A11845; adult ♀; mandible coxale, detail of toothbrush bristles between first and second teeth. × 400.
4. *Megalocypris* sp. (smooth form with hemipenis similar to *M. tuberculata* Sars, 1924); SAM–A11849; adult ♂; antenna, endopod segments. × 40.

5. and 6. Rake-like organs. × 160.

7. Mandible palp, detail of α and β bristles. Note that this male carries only *one* γ bristle. × 160.
8. *Megalocypris princeps* Sars, 1898; SAM–1479; adult ♂; rake-like organ. × 160.

9. and 10. *Megalocypris tuberculata* Sars, 1924; SAM–A11273; adult ♂; rake-like organs. × 160.

11. P I palp. × 40.
12. Furca. × 40.
13. Chitin support. × 40.
14. P II, three terminal segments. × 160.
15. Maxillule palp. × 160.
16. Maxillule third lobe with Zahnborsten. × 160.
17. Antenna, sensory bristle of first endopod segment. × 160.
18. Carapace, muscle scars. × 40.
19. Outline of hemipenis. × 40.

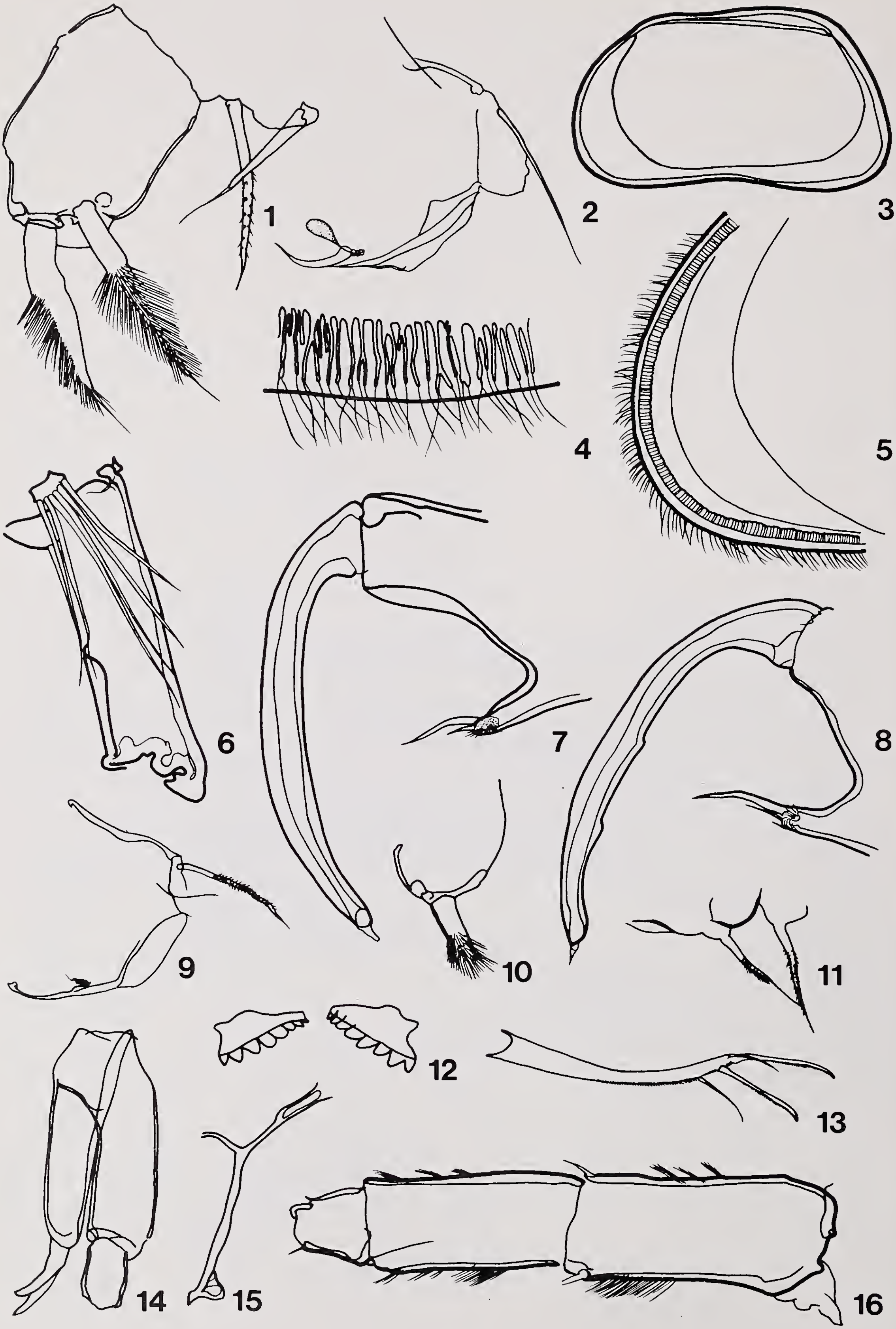

Fig. 24

1. *Megalocypris tuberculata* Sars, 1924; SAM–A11273; adult ♂; mandible palp, detail of α, β and γ bristles. Note that the specimen may be a freak since it carries two γ bristles instead of the normal complement of one only. × 160.
2. Antennule, detail of second segment showing gland, chemo-receptor and bristle. × 160.
3. *Apatelecypris brevis* Sars, 1924; SAM–A11369; adult ♂; carapace, internal view right valve, muscle scars not shown. × 16.
4. Detail anteroventral radial pore canals. × 160.
5. Detail anterior margin right valve. × 40.
6. Antenna, detail 'natatory' setae. × 160.
7. P I, detail of left palp. × 160.
8. P I, detail of right palp. × 160.
9. Antennule, detail of second segment showing chemo-receptor and bristle. × 160.
10. Mandible palp, detail of γ bristle. × 160.
11. Mandible palp, detail of α and β bristles. × 160.
12. Tips of rake-like organs. × 160.
13. Furca. × 40.
14. Maxillule, palp and third lobe showing Zahnborsten. × 160.
15. Chitin support. × 40.
16. P II, three terminal segments. × 160.